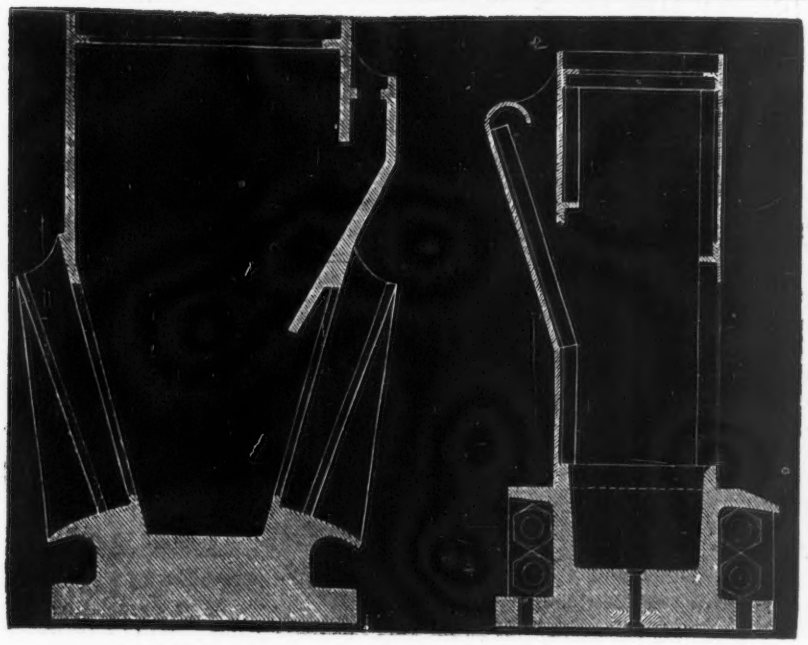
THE ENGINEERING AND MINING JOURNAL.

VOL. XV.—NO. 13.—FOURTH SERIES. NEW YORK, TUESDAY, APRIL 1, 1873. PRICE 10 CENTS PER COPY.



DRY MORTAR. *SECTIONAL MORTAR.*

The American Battery Mortar.

One of the most distinctive features of American stamp mills, and also one of the most creditable improvements which have grown out of the application of American inventive genius to the machinery for treating ores, is the stamp box used in California mills. Its particular advantages are durability, hardiness and *completeness*, by which we mean not only that it fulfills all the functions desirable in a battery box, but also that all parts which are not necessarily movable are combined in one casting, and the box is therefore ready for rapid setting up. Of the mortars for dry crushing there are two sorts, one solid and one sectional, the latter being made in parts for convenience of transportation over mountain roads. We illustrate both of these this week. In the dry mortar the die is set high, the screens are steeply inclined, and there is a double discharge. The peculiar requirements of American silver milling make this dry mortar quite different from that in ordinary use in Europe for dry crushing. Thus the discharge is at the side instead of in the bottom, as in those mortars which are used for very coarse crushing, a difference which is necessitated by the extreme fineness demanded in milling silver ores. The mortar has a width of bottom of about 11 inches, suitable for a die of 8 inches, and an outside length of 52 inches. Its material is cast-iron. The sectional mortar has a cast-iron bed, made in sections, and fitted with a wrought iron top. These sections are held together endwise by strong bolts, and sidewise by a long bar fitted into a groove planed in the bottom and rivetted to the sections. When set up it makes a perfectly firm mortar.

The American Institute of Mining Engineers.

BOSTON MEETING.

SECOND SESSION—WEDNESDAY MORNING, FEBRUARY 19, 1873.

(*Continued from page* 179.)

Dr. T. STERRY HUNT—As regards the iron ores of the ancient crystalline rocks of Northern New York, referred to by Prof. SILLIMAN, Dr. T. STERRY HUNT remarked that his views had already been defined in his opening address, and in the discussion which had followed it with regard to the iron ores of the Laurentian, Norian and Huronian series. One point noticed in the address and again brought forward by Prof. SILLIMAN is, however, worthy of further remark, if only for its economic value; viz. the fact that the iron ores in the old gneissic Laurentian series are constantly found in the vicinity of the crystalline limestones, which, with pyroxenic and hornblendic rocks, are intercalated in this series. This association, according to Prof. SILLIMAN, is now so well known as to be recognized by the explorers in the ore-districts of Northern New York. Dr. HUNT remarked that this important fact had been pointed out by him several years since, and referred to his essay on *The Mineralogy of the Laurentian Limestones*, in the report of the Geological Survey of Canada for 1863—66, since republished in the Appendix to the Regent's Report of the University of New York for 1869. It was there pointed out, that the true Laurentian series (the Lower Laurentian of Logan) as seen in the valley of the Ottawa, includes in an apparently conformable series of at least 20,000 feet of strata, three limestone formations, each from 1000 to 1500 feet in thickness. Associated with these, it was said, are found "strata made up of foreign minerals to the entire exclusion of carbonate of lime, by anadmixture of which they, however, gradually pass into the adjacent limestones. These strata generally consist of pyroxene, sometimes nearly pure, and at other times mingled with mica, or with quartz and orthoclase, often associated with hornblende, epidote, magnetite, sphene and graphite. * * * They occasionally assume a great thickness, and are then often interstratified with beds of granitoid orthoclase-gneiss, into which the quartz and feldspathic pyroxenites pass by a gradual disappearance of the pyroxene. These peculiar strata, which contain at the same time the minerals of the associated gneiss and of the limestones, may thus be looked upon as beds of transition between the two rocks. * * * Besides the minerals already mentioned as predominating in these strata, other species characteristic of the limestones, such as serpentine and magnetite, sometimes make up by themselves great beds in these intermediate or transition strata, which from their mineralogical relations may all be looked upon as related to the accompanying limestones. * * * These limestone groups, as we may designate these limestones with their attendant rocks, appear to be the parts of the system to which the economic minerals belong. The ores of iron, copper, nickel and cobalt, the apatite, mica and plumbago, as well as the serpentines and the marbles of the great Laurentian series belong, so far as is yet known, to the limestone groups.

In subsequent parts of the same essay, the principal facts then known with regard to the occurrence and association of the chief minerals of these limestone formations were set forth, including a description of the iron ore-beds and of the pyrites, graphite and apatite, together with examples of the frequent and intimate association of these various species, both in beds and in fissure veins. Under the head of *magnetite* will there be found a description of large veins of an admixture of orthoclase with crystalline magnetite, in which the latter mineral sometimes predominates. These are, however, carefully distinguished from the far more common beds of magnetic iron-ore which, unlike these veins, are doubtless of contemporaneous formation.

Dr. HUNT then made the following communication concerning

AN OCCURRENCE OF TIN ORES AT WINSLOW, MAINE.

He had already referred to this interesting locality in his opening address, but at the request of some of the members of the Institute, brought before them specimens of the ore and the accompanying rock. The ore which is cassiterite, is also met with elsewhere in Maine, at Paris and Hebron, but it there occurs associated with orthoclase, quartz, tourmaline and beryl, in concretionary granite veins, which cut the micaceous gneisses of the White Mt. series. At Winslow, the veins traverse an impure gray micaceous limestone which, according to Dr. HUNT, is found in many parts of this region, and is regarded by him as subordinate to the same gneissic series. The veins, which are seldom more than an inch in thickness, are abundant through a considerable breadth of the rock, and are interlaminated with it, occupying places between the sedimentary layers, which are distinctly marked by different shades of color. Occasionally, however, they cut across the stratification for a little distance, showing that the disrupting action was not always confined to tearing the layers apart. The veinstone consists of purple fluor-spar, and silvery white mica with quartz. In this gangue the cassiterite, nearly black in color, is disseminated in small crystalline masses, sometimes one-half an inch in diameter, and is associated with a little mispickel. Dr. HUNT had only seen the veins as exposed at a single point, but was informed that similar veins holding the ore are met with at a distance of

several thousand feet. The locality is a promising one and it is to be hoped that efforts will be made to develop it.

THE PRESIDENT—This is not the first time that tin has been reported from New England. DR. JACKSON, I believe, described a vein of it, many years ago, in New Hampshire, in the town of Jackson ; and I think attempts were made to work the vein. DANA'S Mineralogy reports also scanty occurrences of it at Paris and Hebron, in Maine, and at Chesterfield and Goshen, in Massachusetts. But none of these deposits have proved commercially valuable.

Prof. SILLIMAN—There is a very small one at Haddam.

The PRESIDENT—Taking a view of the whole country, we have an occurrence of tin in Missouri, which seems to consist in a curious replacement of titanic by stannic acid in sphene, or some similar mineral. This ore sometimes shows by analysis a small trace of tin ; but I think the amount is not such as to lead us to regard it as any more than a mineralogical curiosity. It must be confessed that this minute discovery of it, bearing the same relation to a valuable ore as Prof. SILLIMAN'S experiment does to commercial diamonds, does not confirm the Missouri "specimens," particularly those of *pulverized* and dressed tin ore, once shown to me in New York, and which I matched at once with specimens of tin washed in Cornish works. I never was able to obtain any genuine visibly tin-bearing Missouri specimens in mass. The pulverized specimen now in my cabinet probably came from Cornwall.

It is well known to members that tin ore varies greatly in its physical appearance. It runs through a wide range of color—from almost white to almost black. We have considerable variety of structure, from earthy to massive and variously crystalline. And it is often easy to recognize the origin of specimens of tin when they are presented, particularly with associated minerals. The specimens shown by Dr. HUNT strongly resemble in some respects those of Zinnwald. The country rock is different, but the association with fluor spar and mica is similar.

We have had very encouraging discoveries of stream-tin in Idaho, but no mines have as yet come of them. There have been small pebbles of tin-ore found in Prickly Pear Creek in Montana. There is a remarkable deposit of tin-ore in San Bernardino County, in Southern California. Some of that ore is very rich, and associated with melaphyr, and not with the character of rocks in which we have been accustomed to expect it. Then we have a curious occurrence from Durango, in Mexico. Mr. ASHBURNER, of San Francisco, who examined the locality, presented me with some specimens, and gave me a description, from which it appears that the tin-ore occurs in an unmistakable trachytic dike. To what extent it could be made commercially valuable it is difficult to say, for the reason that explorations of the deposits were superseded by the fact that the transportation involved from this point was so precarious and costly as to preclude the idea of working at present with profit. It is not very easy to say whether tin mines could be worked in this country, with profit, on a large scale. Very pure ores might be worked, if the production did not affect the market. But the great difficulty in regard to the economical production of tin in this country lies in the unknown limit to which the price of tin might be reduced, if competition required it, by the East Indian producers. I do not know how low they could reduce their price ; it is said that they have always kept it at such a figure as would allow the bare existence of the Cornish mines, and leave the Saxon mines scarcely more than a local market. The Malayan deposits are described as being alluvial in origin, though they are mined partially under-ground. They are worked with Chinese labor, and with such advantage and so little expense of machinery, that it has been supposed that the owners could drop their price one-half if there were any object to be gained by it. If this is so, they are in the position of rulers of the market of the world, in respect to tin, with a power we are not able to gauge. This certainly was the state of affairs some years ago ; but there are some indications that the balance is changing, or has changed. The recent Australian discoveries are very rich and abundant, and will not suffer from long transportation inland. The question is certainly one that requires for its solution a careful study of the financial and commercial as well as the mineralogical conditions.

CRYSTALS OF COPPER.

Mr. RAYMOND made a verbal communication concerning certain crystals of cement copper, which were exhibited. These crystals were received from the Lexington Copper Mine, in Davidson Co., N.C. At this mine the ores are treated by the HUNT & DOUGLAS wet process, and this cement copper was obtained in that method of precipitation. I have been attracted, in examining the specimens, by their hexagonal appearance ; that is, the appearance of crystallization and twinnage, according to the hexagonal system. These copper crystals are apparently prismatic, and joined at angles apparently regular, so as to make those forms with which we are familiar in ice and snow. The angles of the crystals seem to be 60°, 30°, or some multiple or divisor of 60°. I have made no measurements. The members can observe for themselves these beautiful pinnate and dendritic or fern-like forms.

DR. HUNT.—I have seen a specimen of Cornish copper, having the same arrangement that you see in this copper and in antimony. It is after an interval of five-and-twenty years, and I cannot speak with too much certainty.

Prof. SILLIMAN.—I have, in my own cabinet, specimens of copper of rhombohedric forms.

THE PRESIDENT.—That form, as Prof. SILLIMAN says, is common—I might almost say, more common than the true tesseral form of copper—in the Lake Superior region. But it is a distinct case of pseudomorphism, by substitution of copper for calcite in the amygdaloid and other rocks. This, on the other hand, being a direct precipitate, gives rise to a very different set of questions. I presume this appearance of the angle 60° in the arborescent form is due to the dodecahedral angle, of which it is the supplement. The dodecahedron may be said to introduce into the tesseral or isometric system a hexagonal element, since a certain section of it is hexagonal. ROSE and DANA have analysed this complicated form of native copper ; but I do not recollect seeing it so beautifully illustrated as in these specimens.

The session was then adjourned.

THIRD SESSION—WEDNESDAY AFTERNOON.

THE PRESIDENT announced that the resignation of Mr. WILLIAMSON, Treasurer of the Institute, had been accepted by the Council, and Mr. THEODORE D. RAND, of Philadelphia, had been appointed to serve as Treasurer for the remainder of the year. This is a consequence of the resignation of Mr. MARTIN CORYELL, of Wilkesbarre, our late worthy Secretary, and the appointment of Dr. T. M. DROWN, of Philadelphia, in his place. Dr. DROWN had, moreover, resigned his position as Manager, and Mr. CORYELL had been unanimously elected by the Council to fill that vacancy. These changes were all the result of friendly consultation among the officers of the Institute, and dictated solely by considerations of convenience in carrying on its business.

Announcement was also made that, in accordance with the precedent established last year by vote of the Institute, members or associates elected at the February meeting, upon paying their dues to the Secretary, would be considered as having paid up to May, 1874.

Mr. RAYMOND then presented a paper

ON A MINING TRANSIT, AND LAMP FOR UNDERGROUND SURVEYING.

This paper will be found in another column.

The Combustion of Water.

Water is a product of combustion, like any other oxide. It is scientifically as absurd to expect a gain of heat from the decomposition and recombination of its elements, hydrogen and oxygen, as to expect a similar gain from reducing sulphuric acid to sulphur, and burning the sulphur again to sulphuric acid. In all such operations (supposing them to be complete, as in practice they never are, and to involve no incidental leakages of heat), the heat absorbed in the decomposition is equal to the heat generated by the recomposition. If it were not so, perpetual motors would be possible. Sir John Herschel, in his *Lecture on the Study of Natural Philosophy*, adduced this point in illustration of the first of his four "Advantages of Scientific knowledge," namely "in showing us how to avoid attempting impossibilities. He said :

"The smelting of iron requires the application of the most violent heat that can be raised, and is commonly performed in tall furnaces urged by great iron bellows driven by steam engines. Instead of employing this power to force *air* into the furnace through the intervention of bellows, it was on one occasion attempted to employ the steam itself in apparently a much less circuitous manner, viz., by directing the current of steam in a violent blast from the boiler at once into the fire. From one of the known ingredients of steam being a highly inflammable body (hydrogen), and the other (oxygen), that essential part of the air which supports combustion, is was imagined that this would have the effect of increasing the fire to tenfold fury ; whereas it simply *blew it out :* a result which a slight consideration of the laws of chemical combination, and the state in which the ingredient elements exist in steam, would have enabled any one to predict without a trial."

The comparitively new science of thermics, based upon the great discovery of the mechanical equivalent of heat, and the conservation of energy, enables us to calculate exactly the maximum of heat produced by combustion under various conditions, and entirely confirms the results of all experiments in burning water. Yet this absurdity continually crops out among inventors and charlatans ; and it is a curious illustration of the general ignorance of science among "liberally" educated men, that such nonsense finds credulous ears. Only a week ago, the New York *Herald* devoted a congratulatory editorial to a new English "discovery," by which the evils of a scarcity of coal in Great Britain are to be done away. This remarkable process consists in conducting steam into a retort, containing incandescent coke and iron. These take up the oxygen of the steam, and the hydrogen, escaping, is subsequently burned, "with intense heat." There is absolutely no theoretical possibility of a gain in heat by this process ; and as for a saving of coal, when we consider that coal is required to make coke, iron and steam, the substitution of this new fuel is about as reasonable as to burn furniture because wood is scarce, or, according to the famous anecdote of the housekeeping bachelor, order toast because there is no bread in the house.

Simultaneously there is a shout of triumph from San Francisco, where a stock company has been formed, to exploit a similar novelty. Here, also, a steam-jet is to be decomposed, and the hydrogen is to be burned again with immense advantage. And a *savant* in Salt Lake City caps the climax with an argument to show that the amount of heat obtained in combustion is dependent on the quantity of oxygen, not on the quantity of fuel. Oxygen being cheap at Salt Lake, and fuel dear, the revolutionary importance of this discovery is obvious. This genius also proposes to use steam, because it contains more oxygen than air.

We may safely fall back on the ancient saying, and assure these ingenious water-burners that they will "never set the river afire." After a few more examples of disastrous failure, added to the hundreds which have gone before, perhaps the community will accept the positive warnings of science, to the direct benefit of its pocket, as well as its intellect.—*Christian Union.*

On a Mining Transit and Plummet Lamp.

By R. W. RAYMOND.*

Having had recently the opportunity of examining a transit and a plummet-lamp, manufactured by Messrs. HELLER and BRIGHTLY, of Philadelphia, and intended for the use of mining engineers in underground surveying, I thought a description of them would be interesting to such of our members as have work of that kind to do, and accordingly I requested the makers to prepare and send to me a detailed account. There is nothing specially novel, I may remark, in the construction of the transit; its claims to favor must rest upon its compactness and lightness, together with the general excellence of its workmanship. The principal peculiarity is the ribbing and flanging of the parts requiring strength, so as to dispose the minimum amount of material where it will secure the greatest rigidity. This transit is said to be the lightest of American make. I believe CASELLI has sent some from London which are still lighter; but they are perhaps not so completely furnished for field-work. I confess I do not see how the weight can well be reduced any further, unless an instrument could be made of aluminium—a plan which Mr. ROTHWELL once suggested; but which may not, perhaps, be entirely practicable, and, at any rate, has not been tried.

The following is the manufacturers' description of this transit, which they have designed and introduced within the last year:

It is a small, portable angle instrument, similar in principle to the ordinary "engineer's transit," and a *fac simile* in every respect, (excepting size and weight) of their "complete engineer's transit." It has long compound centers; the horizontal limb is read by two double opposite verniers, placed outside the compass box; the vernier openings in the plate being made very wide, so as to allow the easy reading of the graduations. There is a three-inch magnetic needle, and its ring is divided to half degrees. The telescope is 7½ inches long, with object glass fifteen-sixteenths inch in aperture, and shows objects erect and not inverted. A sensitive level, 4½ inches long, is attached to the telescope, for reading angles of elevation and depression, etc. The tripod is furnished with an adjustable head for precise plumbing of the instrument over a center; and the wooden legs of the tripod are made in such a manner as to form one leg when folded together. The plates, vertical circle, etc., are provided with clamps and tangent-screw movements; and the clamps on the axis of the telescope are arranged with sighting slits and indexes, so as to answer also for right angle sights. The numbering of the compass ring and horizontal limb, instead of being in quadrants from 0° to 90° each way, as usual, is a continuous one, or from 0° to 360°; but every quadrant of the horizontal limb is also marked with its magnetic bearing, *i. e.* from 0° N. to 90° E., every ten degrees is marked N. E.—from 90° E. to 180° S., every ten degrees is marked S.E., etc. The advantage of this arrangement is, that if at starting, the vernier of the horizontal limb be set to read the same bearing as the needle, the needle can be screwed up, *and both the angles and magnetic bearings read from the horizontal limb, without using the needle for the remainder of the survey*, thus precluding any error from local attraction, reading from the wrong end of the needle, or loss of time in waiting for the needle to settle. The telescope, though short, is a very powerful one, magnifying and having the clear ness of an ordinary 17-inch level telescope. A reflector for illuminating the cross-wires in dark places is used, as is also an extension tripod leg for lowering or raising the instrument. All the working parts of the needle-lifter, clamp and tangent-screw movement are concealed between the plates, making the instrument more compact. A prism and tube for attaching to the eye-piece of the telescope, for sighting vertically in shafts, is also furnished. The weight of the instrument, exclusive of the tripod, is about 5½ pounds; the weight of the tripod is 3½ pounds; the height of the instrument from the tripod legs is 7 inches; the extreme diameter of plates, 5 inches; the diameter of the horizontal plate at the point where verniers and graduations meet, 4½ inches. The instrument and tripod head are packed in a box 7½ inches square, arranged with straps to allow its being carried over the shoulder in the same manner as an army officer's field glass, while the folded tripod legs answer as a cane. Though these instruments have been specially designed for mining use, yet from their lightness and compactness they are also meeting with favor for geological surveys, and for preliminary railroad reconnoisances; when used for these purposes, an extra pair of hairs for stadia purposes (*i. e.*, measuring distances without chaining) besides the ordinary cross-hairs, is added.

The same manufacturers make a very convenient plummet lamp, for underground work. It consists of a brass lamp, suspended by two chains, and terminating below in a conical plummet. The so-called compensating ring is an equatorial ring, surrounding and supporting the lamp, which swings freely within it, upon an axis. The two chains are attached to this ring at the extremities of a diameter perpendicular to the axis. By means of this arrangement, the point of suspension, center of lamp flame, and steel point of plummet always lie in a true vertical line, no matter how much the brass supporting chains may alter in length from the heating of the lamp, kinking or wearing of the links. A shield at the top prevents the flame from burning the string. These lamps are generally used in pairs for back and forward sights.

I understand that Mr. MCNAIR of Hazleton and Mr. COXE of Drifton, both members of this Institute, have used this instrument with satisfactory results.

* A communication to the American Institute of Mining Engineers, at the Boston meeting, February 19, 1873.

The Use of the Plummet Lamp in Underground Surveying.

By ECKLEY B. COXE.*

In the anthracite coal regions of Pennsylvania the custom has been to sight either at an open light (generally a mine lamp), or at the string of a plumb-bob. If the station was intended to be a permanent one, a spud, as it is called, that is, a nail resembling a horse shoe nail with a hole in the head, is driven into the timbers over the station, or, if there be no timber, a hole is drilled in the coal or rock roof into which a wooden plug is driven, which serves to hold the spud.

The first operation in making a survey, is to lay out the stations, that is, to mark the place where the holes are to be drilled for the plugs or the points on the timbers where the spuds are to be driven in. This should be done before any instrumental work is begun, as much labor can generally be spared and the use of very short sights can often be avoided, by carefully laying out the stations before hand. When the stations were laid out, a plumb-bob was hung from the innermost spud, which I will call No. 1, the instrument was put in position at No. 2, by plumbing down and putting a center pin under the spud, and then setting up over the center pin, and another plumb-bob was suspended from No. 3. If great accuracy was not required, a mine lamp was set up under the plumb-bobs at No. 1 and No. 3, and the engineer sighted at them. If great accuracy was required, a lamp or some white surface was held by an assistant behind the strings of the plumb-bobs. To work with any speed by the latter method, (*i. e.*, the accurate one,) it was necessary for the engineer to have three assistants on whom he could rely even when the chaining was done afterwards; viz.: one to hold the light behind the string at No. 1, one at No. 3, and an assistant at the instrument to hold the light while levelling, reading the instrument, etc. When using lamps on the ground, it is necessary to examine them from time to time to see that they have not sunk in the mud or turned on one side, etc. besides, the flame of a mine lamp is a very large object to sight at, and sometimes it is impossible to see it on the ground (when it can be well seen two or three feet above it), in consequence of some intervening obstacles. Being so situated that it was necessary for me to do a certain amount of accurate work, where I could not rely upon having more than one competent assistant, I had the plumb-bob lamps constructed, and I work with them with a single assistant in the following manner:

When the stations have been laid out, I go to station No. 2 with the transit, and by means of the plumb-bob belonging to the instrument, I place the center pin, (a small block of lead with a steel pin in it,) precisely under the spud No. 2; I then remove the plumb-bob and set up my instrument. While I am doing this, my assistant takes the two lamps, suspends one from spud No. 1, and the other from spud No. 3, and then comes back to hold the light for me while I make the final adjustments and take the readings. My instrument is graduated to 360°, and has two verniers 180° apart. I set the vernier at zero, and sight backwards to lamp No. 1. The flame is very small and has a blue central cone which I bisect. I then read the compass needle, invert the telescope, deflect and sight at No. 3, and read both verniers and the needle. I then turn the telescope back, sight upon No. 1, and turn the vernier plate round nearly 180° until I sight No. 3, and again read both verniers. I obtain thus four readings of the deflection from the vernier, and a compass reading as a check, and as the lights are steady and small, the readings can be made very accurately and quickly. If the four readings agree (with their difference of 180°), I am sure there is no mistake and go on. I then take up my transit, go to No. 3, run down the lamp to near the ground, put my center pin under it, remove the lamp and begin to set up.

In the meantime, the assistant brings the lamp from No. 1 to No. 2, and then takes the lamp from No. 3 to No. 4, and comes back to No. 3 to assist me at the reading of the instrument. The work goes on in this way until all the angles are measured. I then go back and chain the distance from one station to another, and take notes of the workings, etc. In this way, two persons can make a very accurate survey as quickly as three can by the old method. Of course if one has assistants enough the chaining can go on with the instrumental work.

The Fire-Proof Question.

BY ALOHA VIVARTTAS, ARCHITECT AND ENGINEER.

A stranger might fairly infer, from the sudden increase in the call for something fire-proof—something actually indestructible by fire—that the popular conscience had been awakened most hopefully, and that the final Judgment day was fixed. But, upon further investigation, he would find that the strong fear upon men was not for their souls in the future, but for their pockets in the present; that the loss of over a score of lives had made less impression upon the public mind, than the loss of a few thousand dollars in the same fire. But what is this that the *vox populi* demands of the architects? "A building that cannot burn" in the ordinary sense of the word, iron, stone, brick, or concrete would do; but that is not all: it is also required to make "a building that cannot be burned." A building that may be crammed full of fuel of various kinds, and in which fires, close—in stoves—and open—in grates—gas-lights, kerosene lamps, matches, and cigars can be kept and managed as carelessly as may be; but wherein damage from fire, either to building or contents, shall be an impossibility.

True, this popular voice is unreasonable, but it is encouraged by each char-

* A paper, read at the Boston meeting of the American Institute of the Mining Engineers, Feb. 19, 1873.

latan, with his new plan for material salvation; and it is encouraged by the insurance interest. Not only is this physical impossibility a good tub for the public whale, but also such a demand is supposed to stimulate inquiry among inventors, and some improvement is hoped for.

But it is not encouraging to the architect, who knows that, build as he may, he cannot supply the house with that careful vigilance, continuing through all time, which is the only security that Nature admits.

A stroke of lightning fired the Escurial; but, without that help, a servant may run a stovepipe through a wardrobe, from some whim or other, and, lighting a fire in a stove, burn some one's clothes, as was done in a boarding-school, and one of the oldest and quietest in New England, only a few weeks ago. The architect knows that for watchman, or stoker, a green boy is as likely to be employed as a man, steady, reliable, and beyond the age of recklessness; he knows that, in part, this arises from the very existence of the insurance system. It is nothing uncommon to hear owners excuse their shortcomings and carelessness of the general good by such expressions as—"I am fully insured," "it would be no loss to me," etc.; and this, too, from men who have no criminal desire to prey upon the Insurance Company.

But suppose a building burns; it is, perhaps, surrounded with heat and flames, as in Chicago or Boston, of such intensity and quantity (the latter a very important element in the problem, since a common blowpipe will produce a heat intense enough, if the quantity were sufficient, to destroy almost any known material) as to destroy it, and it is at once denounced as a tinder-box by those who know little of its quality. That the architects may, for their own sakes, be trusted to investigate this subject with the most efficient aid that science can supply, lies in the nature of the case, and the quality of the profession as a class. That they are doing so in a thorough and earnest manner, is shown by their promptness to test each new "fire-proof" paint, partition, roof, or what not, brought before them. And in evidence that they are awake in this matter, not only as individuals, but also as a body, let any one read the very interesting remarks of Mr. P. B. WIGHT, and others, before the American Institute of Architects, upon the Chicago fire. The whole discussion is of interest, but only a few of the points in it can be mentioned here. First, in regard to brick, Mr. WIGHT says the heat was so intense that "some of the brick were actually burned * * * seemed to have been rounded off by the heat * * showing almost total destruction; and reduced to softness, instead of being over-baked and vitrified, as is very often the case." Again he says: "All kinds of mortar seemed to stand heat better than stone. There were places, I noticed, where bricks were burned out, and chipped off, and where the mortar stood out between the bricks, showing that the mortar stood the heat much better, just as the artificial stone stood the heat better than the sandstone and limestone." Again, of stone, "There was a twenty-inch brick wall upon a stone wall. The stone wall, I presume, was two feet thick; this was a party-wall, and it was actually scooped out about six inches, showing that the stone wall burned out under the brick wall." The sandstones and limestones appeared to stand, as usual, better than the granite; but the, so-called, petroleum stone "stood the test better than any other natural stone in the city." Of iron: "Wrought-iron floors, or wrought-iron beams, in many places gave way very readily. * * The effect upon iron columns was most lamentable. In the so-called fire-proof buildings the damage was, in almost every case, caused by the giving way of cast-iron columns, which seemed to yield very readily. Another gentleman at the same meeting, Mr. HATHORNE, said that he saw "telegraph poles, where the buildings about them were entirely destroyed; the poles, being of the ordinary size, stood—not perfectly, of course—but charred."

Neither of the gentlemen gave any description of the effect of heat upon concrete, the mixture of cement and broken stone sometimes used. From the general tenor of the evidence from all sources, it would appear that a scale of the qualities of various materials for enduring heat would show iron next to wood; then granite, sandstone, limestone, including marble, slate, artificial stones, with probably the concrete mentioned ranking with brick and mortar. In this classification it is interesting to note that in cases where a very high heat has been used in preparing the material to give it the hardening quality, whether directly, as in brick, or indirectly, as in mortar, the material stands better than natural formations of any kind. We may hope for good results from the protection of all iron sustaining weight, by a covering of plaster. Here is where we suffer most from the charlatan, with his fire-proof paint or prepared roofing.

No thin coat can be a safeguard against continued heat; asbestos itself, although called the most indestructible substance known, will still transmit heat far too readily to stand as a protection in all cases. A piece of it may be brought to a red heat in the flame of a common candle, and will then char its way into wood, like a piece of hot iron.

But while all known substances will conduct heat to a greater or less degree, there is still a very great difference among them in that respect. The records of PECLET, RUMFORD, TYNDALL, LAVOISIER, DULONG and a host of others, show all of the metals as conducting heat more readily than stone, stone doing the same thing more than glass, brick or plaster, these in turn conducting more rapidly than wood, and the wood as conducting more than the powders of coal, chalk or wood ashes. In this scale it may be noticed that the more air a substance contains, that is, the more porous it is, the better it is as a non-conductor. [Air itself is a good non-conductor, but it permits radiated heat to] pass with little hindrance; and although, used as a current to carry off surplus heat, it is very effective, yet it is liable to be treacherous, and in a case where much heated, as in Chicago or Boston, may cause the disaster it was intended to avert.

It is said that they build fire-proof buildings in Europe. The statement is loosely made and misleads. In all Europe there are no buildings more fire-proof than there are in America; but the proportion of buildings well and thoroughly built, is larger there than here, not from any superiority of the architects or builders, or of the material, but from the fashion; or in other words because the voice of the people demands it, and the owner finds, or at least believes, it to be his real interest to have good work even if it does cost money, and slop work is condemned by all. Fires are much less common there than here; yet Canterbury is a witness, as are numberless other cases, that such things occur. And in truth the smaller proportion of fires in England is due no more to the fire-proof character of their houses, than to the greater humidity of their climate; to the milder nature of their winter, requiring fewer fires and less of that baking process, undergone by the average American house; and last, but by no means least, to the greater care exercised, the custom of stokers and watchmen feeling their responsibility, knowing that they are expected to be thorough, and that if a fire occurs in a building under their care, their character, their value in the labor market will depreciate not merely with their immediate employers but with the public, and that the sin of carelessness would cause them to lose caste, even among their fellow workmen. But take any dwelling house in Europe; bring it to America; bake it all winter on the inside with artificial heat, roast it all summer by the sun upon the outside, put Americans or cast-off Europeans in it, to control it, and it will be no more safe than an American house of similar materials.

The Mansard roof has been much blamed; but are there none in Europe? That they may generally be improved by using a greater thickness of the non-conducting material, and applying it more generally, is true; and almost any architect will joyfully do it, if the owner will bear the expense. But while the owner will give thousands of dollars to carry his house a few feet higher than his neighbor's, he will often not give one cent to make his building stronger or safer, and worse than all he will scout the idea of putting a few hours actual thought or care into this subject. There are exceptions. The writer, in his younger days, was working for a contractor; and in a particular case was, with his fellows, told to "slap the work up and not be too particular about it." The order in various forms was repeated, and was also discussed among the workmen, and there was but one construction of the meaning of it. The work went on; but the owner of the building was always there, looking on, and watching everything—never speaking, simply looking. The men felt it; each one considered his own individual character as a workman, as of more consequence to himself than obedience to the orders of the boss; and when the work was done, the foreman excused himself, and all hands, to the contractor, by simply telling him that "it was impossible to slap that job up, for the owner never left him a minute." Were owners, or their representatives, always one half as careful as this old man, defective flues, leaky roofs, settling foundations, cracking walls, dangerous contiguity of heated to inflammable substances in partitions and floors, and fire-leaks of all kinds, would be more rare, than safe buildings are at present. An instance showing the care needed is furnished by the case of a building in this city. A fire started in a floor where the steam pipes passed through. That floor was laid on felt, and both felt and flooring had been cut, leaving a hole in each about one inch larger than the pipe. A cigar-stump thrown towards the heater ignited the felt, the fire ran along, across the room, between the joist, cutting felt and floor, and finding leaks enough to fill the next room with smoke, and alarm its occupant in time to save the building. In this way a rat-hole is actually a fire trap, and any leak ventilates the flame.

But suppose the great result attained, suppose both houses and contents to be indestructible by heat, where shall we find the race of salamanders to enter and enjoy? Of the thousands who talk "fire-proof," how many would sacrifice their cigars because they sometimes burn their fingers?

In short, it is utterly impossible to say that any one method or material will render a building absolutely fire-proof; but only so in degrees differing with the circumstances of each case. As has been said, the vaunted fire-proofs of Europe would not stand the test in this country, while such care as is exercised there has never failed to have a good effect here. Again, for extinguishing fires we live in an anomalous age. Many of our fires are, from beginning to end, such as to almost defy water. A kerosene lamp upset in a warehouse full of alcoholic liquors, would gut the best fire-proof of Europe or America, almost anything, in fact but an iceberg. But the Government powder magazines are seldom much affected by fire, and not only because the men in charge are there at the risk of their lives, (for every man working in a private powder mill labors under a similar risk, yet powder mills blows up far oftener than the government magazines,) but chiefly because the Goverment rule is strict and inflexible, and the men are trained to obey it. If the manipulations in a powder mill are extra hazardous, so the care taken should be extra great; and if a mill can run one year without an explosion, it may run another year, and any such explosion occurring, argues a laxity, a want of care and thoroughness on the part of some one. In the same way all fires in excess show fault somewhere. But given a building that stands from one to a hundred years before it is burned, which is more likely to be at fault, the architect and the mechanic who built it, and saw it no more, or the parties who occupy it and light many matches in it every twenty-four hours, any one of which matches could light a fire that would at least burn all of the contents; contents over which the architect and builder never had any control.

In conclusion, there can be no fire without a beginning; and if each man for himself took care to never let a fire begin by his fault, the Fire Department would become a sinecure, and insurance companies an unnecessary luxury.

THE COAL TRADE.

NEW YORK, March 26, 1873.

Mr. JOHN MOORE, 61 Trinity Building, reports the following averages at the last Scranton sale.

	April.	March.	Advance	Decrease.
5,000 Lump	$4,17½	$3,87	30½c.	—
10,000 Steamboat	4,15	4,10	5	—
20,000 Broken	4,34½	4,19	15½	—
15,000 Egg	4,58	4,45	13½	—
35,000 Stove	5,03	5,24	—	21c.
15,000 Chestnut	4,17	3,96	21	—
100,000 Average	4,56½	4,41	15½	—

This advance is for the most part due to the fact that the price of Scranton coal had been rather below the market. Chestnut coal was in demand on account of the shipment of this size to Eastern markets. Prices are thus well sustained, though consumers are said to be holding back in fear that the present advance will not hold, or at all events will not be increased. They are reported to hesitate between the chances of a strike and the belief that coal will not go up again. We doubt if this is good policy. Coal is pretty certain to maintain its present rate, and there is in fact no small prospect that it will rise month by month. The demand is good. The organic changes in the mode of marketing coal, which have been so marked a feature of the last few months, have entirely altered the attitude of producers, and a further increase of prices is expected by some of the most cautious men in the trade. This is a speculation of which it will not do to be too positive. But at all events there is good reason for saying that consumers had better not count upon a fall, but lay in full stocks as fast as they need them.

The price of the Delaware and Hudson Company's coal is Furnace, Lump, $4,45; Steamer, Lump, $4,55; Grate, 4,65; Egg, 4,80; Stove, 5,00; Chestnut, 4,45. Deliveries from Rondout are expected to commence April 7, and the above prices are for coal at that point. Freight to New York 65 cents.

The following prices have been fixed by the Lehigh Coal Navigation Company, delivered at Port Johnston, N. J.

	Old Co's Lehigh,	*Room Run,*	*Plymouth*	*Newport,*
Lump,	$5,50	$5,25	$	$
Broken,	5,30	5,20	4,75	4,75
Egg	5,30	5,20	5,05	4,90
Stove,	5,35	5,25	5,25	5,10
Chestnut	4,60	4,60	4,55	4,55

Deliveries via canal, alongside at New York, 35 cents additional.

While hard coal is selling at prices which are a decided advance upon the rates of last year, soft coal is returning from the disturbed condition of the winter market to lower rates. The Franklin Company, 71 Broadway, quotes Cumberland coal at $5 free on board at Baltimore, freights to New York $2,50. Trade is good, and and with the higher rates for anthracite, the bituminous coal bids fair to be in active demand throughout the year. The relation of these coals to each other is different in the American market from every other market in the world. Here anthracite predominates, a fact due of course to the abundance and excellence of the Pennsylvania anthracite, and the position of its mines between the soft coal mines and the markets, giving to it a shorter line of transportation. Its cost to the consumer is therefore comparatively low, and we find hard coal used in innumerable instances where soft coal is employed abroad. It is the fate of the Maryland and Virginia mines to stand in close competition with a formidable rival, a competition that has heretofore been intensified by the rivalry of hard coal producers among themselves. The late events which have lessened the latter rivalry, and placed hard coal upon a higher basis—and probably permanently so—cannot fail in the long run to to tell in favor of the soft coal. The increase in the production of iron in Pennsylvania and other Eastern States, will assist this improvement, for though anthracite will be used in a majority of the blast furnaces, soft coal will be burned in the subsequent processes of iron manufacture, processes which require a much larger consumption of fuel than the mere smelting of the ore. The increase of pig iron production, will therefore tell more in favor of the soft coal production than of the anthracite.

Gas coals exhibit the same anomalies that we spoke of two weeks ago. The Virginia companies cannot put it down in New York for less than $6,50, at Baltimore *plus* $2 25 freight, or $8,75 in all, while the Penn Company is able to sell at $8,15 in New York. Whether the magnates of the Baltimore and Ohio road can be induced to alter their sovereign pleasure, and reduce their demands for freight, cannot be told, but the Virginia companies are trying to do business and we hope they will succeed.

Anthracite Coal Trade for 1872 and 1873.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending March 22, 1873, compared with the week ending March 23, 1872.

COMPANIES.	1872. WEEK.	1872. TOTAL.	1873. WEEK.	1873. TOTAL.
*Phila & Reading R.R†	72,105	280,436	100,463	1,031,102
*Schuylkill Canal	....	13,356	...	6,594
*Lehigh Valley R. R.	51,598	327,676	50,507	312,045
Lehigh & Sus. R. R.	23,940	299,730	41,805	415,431
" " "	....	....	...	...
Scranton North	6,718	142,748	10,759	141,069
" South	33 676	439,717	36,789	429,128
Penn. Coal Co., rail	15,581	203,153	17,623	171,708
" " " canal	....	...	....	....
Del. & Hud. Canal Co.	....	....	....	....
" " East	11,932	131,613	7,638	76,658
" " West	6,740	86,664	8,074	95,193
" " South	4,311	74,062	5,046	70,160
Shamokin	6,732	82,850	8,740	111,498
Trevorton	....	....	....	....
Lykens Valley Coal Co.	....	....	....	....
Wyoming North	....	....	....	....
Wyoming South	....	....	....	....
P. N. Y. C. & R. R. Co.	10,404	151,854	12,305	167,629
Williamstown Col'y	....	.....	....	....
Big Lick Col	....	.....	....	....
Total	243,737	3,343,919	299,699	3,528,415
1870			243,737	3,343,919
Increase			55,962	184,496
Decrease				

These figures are for the week and fiscal period commencing Nov. 30.

† Less coal transported for Company's use and Bituminous coal.

Bituminous Coal Trade, 1873 and 1873.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending March 22, 1873, compared with week ending March 23, 1872.

COMPANIES.	1872. Week.	1872. Year.	1873. Week.	1873. Year.
C. & O. Canal	8,131	8,845	783	783
B. & O. R. R.	22,743	222,819	30,537	266,631
Penn. S. Line	....	.....	2,342	21,536
H. & B. T. R. R.	6,803	59,711	9,305	90,692
*Harrisburg & D.	11,064	128,866	6,013	82,339
*L. V. R. R.	556	8,970	1,158	7,965
P. & N.Y.C. & R. Co.	6,630	88,340	6,501	69,525
Cumberl'd Branch Canal	3,062	3 0 2	....	....
" Railroad	291	291	3,287	26,691
Total	59,580	520,904	59,926	566,182
			59,580	520,904
Decrease				
Increase			346	45,278

Report of Coal Transported over Central R.R. of N. J. (Lehigh and Susq. Div.)

Week ending March 22—Compared with same time last year.

WHERE SHIPPED FROM	TIDE. tons ct.	LOCAL. tons ct.	TL. WEEK tons cwt.	TL. DATE. tons. cwt.
Wyoming Region	21839 14	10853 07	32493 01	339136 12
Upper Lehigh Region		2873 15	2873 15	44422 04
Beaver Meadow Region	2127 01	1868 14	3995 15	39309 04
Hazleton Region		199 11	199 11	3516 01
Mauch Chunk Region		9008 15	9008 15	88505 00
Treskow Region				
Mahanoy Region				
Total	23966 15	24604 02	48570 17	514889 01
Previously reported	238373 13	227944 11	466318 04	
Total to date	262340 08	252548 13	514889 01	
Same time last year	206762 08	155453 01	362215 09	
Increase	55578 00	97095 12	152673 12	
Decrease				

DISTRIBUTION.	WEEK 1873.	WEEK 1872.	YEAR 1873	YEAR 1872.
Forwarded East by Rail to Tidal points	23966 15	20784 13	262340 08	206762 08
Forwarded East by Rail to Local points	9,516 02	991 09	115392 15	66848 09
Forwarded East by Rail use Central Division	1813 19	976 14	19890 09	17023 15
Forwarded East by Rail use L. & S.	266 15	115 11	2040 02	1950 11
Delivered at and above Mauch Chunk	1455 01	826 11	19129 12	12701 00
Delivered at Coalport & Hazard for Canal	6508 07	1187 08	17807 00	7096 10
Delivered to L. V. R.R. at Packerton	523 07	3 9 16	10266 11	3927 15
Delivered to L. V. R. R. at Sugar Notch	1569 08		20692 18	
Delivered to L. & B. R. R. at Plymouth Bridge	2961 03	2224 12	46329 06	43906 01
Total	48570 17	27496 14	514889 01	362215 09

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Company for the week ending Saturday, March 22, 1873.

	WEEK.	SEASON.
By Delaware and Hudson Canal	....	....
By Railroad, East	7,638	95,193
" West	8 024	70,160
" South	5,046	65,115
Total 1873	20,708	242,211
Corresponding time in 1872:		
By Delaware and Hudson Canal	....	....
By Railroad, East	11,932	131,613
" West	6,740	86,664
" South	4,311	74,062
Total	22,983	292,339
Decrease	50,128	

Pennsylvania Coal Company.

Shipments of Pittston Coal for the week ending March 22, 1873.

	1873. WEEK.	1873. YEAR.	1872. WEEK.	1872. YEAR.
By Railway	17,623 02	171,707 12	15,580 14	203,153 09
" Canal	....	.....	.....	.....
Total	....	....	....	.....
Decrease 1873	31,445 17			

Statement of Coal Transported over Cumberland and Pennsylvania Railroad

During the week ending Saturday March, 22, and during the year 1873, compared with the corresponding period of 1872.

WEEK.

	C. & O. C'l Tons. Cwt.	B. & O. R. R. Tons. Cwt.	Pa. S. Line Tons. Cwt.	Total. Tons. Cwt.
1873	782 19	30,536 14	2,342 03	33,661 16
1872	8,431 07	22,743 07	....	31,174 14
Increase		7,793 07	2,342 03	2,487 02
Decrease	7,648 08	.....	....	

YEAR.

1873	782 19	266,631 09	21,536 08	288,950 16
1872	8,845 03	222,818 17	....	231,664 00
Increase	....	43,812 12	21,536 08	57,286 16
Decrease	8,062 84	....	....	....

Cumberland Branch R. R.

WEEK.

	To C. & O. Canal. Tons. Cwt.	To B. & O. R. R. Co. Tons. Cwt.	Total. Tons. Cwt.
1873	—	3,287 09	3,287 09
1872	3,062 05	290 10	3,352 15
Increase	—	2,996 19	.....
Decrease	3,062 05	.....	65 06

YEAR.

1873		26,691 18	26,691 18
1872	3,062 05	290 10	3,352 15
Increase		26,401 08	23,339 03
Decrease	3,062 05		

Report of Coal Transported over Lehigh Valley Railroad

Report of coal tonnage for the week ending March 22, 1873, with totals to date, compared with same time last year.

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	TOTAL Tons. Cwt.
Total Wyoming	13,489 03	193,906 19
" Hazleton	29,211 02	486,914 02
" Upper Lehigh	107 01	1,471 19
" Beaver Meadow	19,654 15	181,414 00
" Mahanoy	6,270 13	94,851 12
" Mauch Chunk	1:9 06	1,459 17
Total	59,862 00	965,048 09
Same time last year	60,976 10	957,087 02
Increase		7,961 07
Decrease	1,114 10	
Forwarded East from Mauch Chunk by rail	50,506 15	812,045 08
Same time last year	51,597 10	847,675 13
Increase		
Decrease	1,090 10	15,630 05

DISTRIBUTED AS FOLLOWS.

Forwarded East from Mauch Chunk by rail	49,404 10	795,243 04
do East for use L. V. R. R.	1,102 05	16,802 04
Delivered at and above Mauch Chunk for use of L. V. R.R.	1,389 16	21,333 09
To P. & N. Y. R. R.	6,996 17	103,107 16
To N. C. R. R., at Mount Carmel	.....	2,691 02
To D. H. & W. R. R.	439 03	12,910 19
To L. & S. R. R. at Packerton for rail	225 16	4,536 06
Delivered at M'h Chunk	37 10	1,323 00
Delivered on line of road above Mauch Chunk	215 15	5,369 09
To L. & S. R. R., at Penn Hav., for railroad		1,541 10
Do. for canal		
To Lehigh Canal Mauch Chunk		
To Catawissa Railroad		35 00
To L. & B. R.R. at Lack. Juno	50 04	154 10
Total	59,862 00	965,048 09

Penn. and N. Y. R. R.—Coxton, Pa.

Coal tonnage for week ending March 22, 1872.

	Week. Tons. Cwt.	Total. Tons. Cwt.
Anthracite received:		
From Lehigh Valley R. R.	6,996 17	103,107 16
" Lack. & B. R. R.	861 12	8,911 00
" Pleasant Valley R. R.	3,403 02	44,342 00
" Sul. & Erie R. R.	1,013 05	11,267 17
Total	12,304 16	167,629 02
Same time last year	10,403 16	151,854 03
Increase	1,901 00	15,774 19
Decrease		
Distributed:		
To Lehigh Valley R. R.	424 04	10,257 02
To Lack. & B. R. R.	9 02	304 09
To S. Central R. R.	2,294 13	35,350 05
To Ithaca & A. R. R.	3,096 10	27,225 15
To Erie R. W. Pockets for shipm't.	4,198 13	49,968 02
To individuals on line of road	229 05	14,095 02
To points at & above Coxton for use of Co.	610 19	8,483 17
To points between Waverley and Elmira	1,426 10	21,444 17
Total	12,304 16	167,629 02
Bituminous received from BARCLAY R. R.		
Shipped north from Towanda	6,488 12	69,004 15
Shipped south from Towanda	12 18	519 18
Northern Central R. R.	....	.....
Total	6,501 10	69,524 13
Same time last year	6,630 06	88,340 02
Increase		
Decrease	128 16	18,815 09
Distributed:		
To Erie Railway	5,618 05	57,858 12
To So. Central R. R.	842 14	11,012 6 5
To Ithaca Valley R. R.	27 13	9 9 (1
Lehigh Valley, R. R.	....	2 9 7 (9
To individuals on line of Railroad	....	1 19 12
To points on line of road for use of Company	12 18	118 04
Total	6,501 10	69,524 13
Grand totals transported		
Anthracite	12,304 16	167,629 02
Bituminous	6,501 10	69,524 13
Total	18,806 06	237,153 15
Same time last year	17,034 02	240,194 05
Increase	1,772 04	3,040 10
Decrease		

Philadelphia & Reading Railroad and Branches.

COAL TONNAGE

For the Week ending Saturday, March 22, 1873.

BY RAILROAD.—ANTHRACITE.

PASSING OVER MAIN LINE AND LEB. VAL. BRANCH.

	Tons.	Cwt.
From St. Clair	29,074	11
" Port Carbon	4,909	04
" Pottsville	2 6 5	16
" Schuylkill Haven	27,099	07
" Pine Grove	5,750	08
" Tamaqua	12,377	06
" Harrisburg		
" Dauphin	2,937	02
Total	84,783	11

FOR SHIPMENT BY CANAL.

Passing Frackville Scales		
" Mill Creek "		
" Schuylkill Valley Scales		
" Mt. Carbon "		
" Oreesona "		
" Pine Grove "		
" Tamaqua "		
Total		

SHIPPED WESTWARD VIA CATAWISSA AND WILLIAMSPORT BRANCH AND NORTHERN CENTRAL RAILROAD.

Via Catawissa & Williamsport Br.	163	10
" N. C. R. R. passing Locust Gap		
" " " Shamokin	2,763	14
" " " Herndon		
Total	2,927	04

SHIPPED WEST OR SOUTH FROM PINE GROVE.

Via Schuylkill & Susquehanna R. R.	1,687	16
" Lebanon & Pine Grove Branch	665	19
Total	2,353	15

CONSUMED ON LATERALS.

From Frackville Scales	382	00
" Mill Creek "	793	04
" Schuylkill Valley Scales	38	02
" Mt. Carbon "	609	09
" Oreesona "	267	18
" Pine Grove "	57	08
" Tamaqua "	415	19
Total	2,565	00

LEHIGH AND WYOMING COAL.

Received via Silverbrook Junction, Sent East		
Cat. & Wpt. Br. Sent West	4,610	10
" " Rupert, Cat. & Wpt. Br.		
" " Allentown, E. Penn'a Br.	68	13
" " Alburtis, " "		
" " Oreland, G. & N. Br.	1,167	14
" " Connecting R. R.		
" " Willow Street R. R.	860	00
Total	6,706	17

BITUMINOUS.

From Harrisburg	5,973	01
" Connecting R. R., G. & N. Br.		
" Junction R. R.	40	00
Total	6,013	01

COAL FOR COMPANY'S USE.

Anthracite	7,664	17
Bituminous	389	02
Total	8,053	19

RECAPITULATION.

	Total for Week.	Corres-p'g week last year.	Increase and Decrease.	
Passing over Main Line and Leb. Val. Branch	84,783 11	55,923 19	i	28,859 12
For Shipment by Canal	1,126 04	3,990 11	d	2,864 07
Shipped Westward via Northern Central R. R.	2,927 04	4,987 19	d	2,060 15
Shipped West or South from Pine Grove	2,353 15	2,314 08	i	39 07
Consumed on Laterals	2,565 00	3,676 13	d	1,111 13
Lehigh and Wyoming Coal	6,706 17	1,311 12	i	5,395 05
Total Anthracite paying freig't	100,462 11	77,105 02	i	28,357 09
Bituminous	6,013 01	11,064 03	d	5,051 02
Total of all kinds paying freig't	106,475 12	88,169 05	i	23,306 07
Coal for Company's use	8,053 19	4,913 17	i	3,140 02
Total Tonnage for Week	114,529 11	93,083 02	i	26,446 09
Previously this year	1129224 08	1070369 03	i	58,855 05
Total to date	1243753 19	975,095 15	i	85,301 14

SHIPPED BY CANAL.

From Schuylkill Haven			
" Port Clinton			
Total Tonnage per Week			
Previously this year			
Total to date	6,594 00	13,355 16	d 6,761 16

Northern Central Railway, Shamokin Division.

Below is the return of Coal sent over the Shamokin Division of the N. C. R. W., for the 7 days ending March 21, 1873.

	Tons.	Cwt.
East	1,293	10
West	7,447	00
	8,740	00
Same time last year	6,732	00
Increase	2,008	00
Decrease		
Total amount shipped to date	111,497	11
Same time last year	82,850	09
Increase	28,647	02
Decrease		

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Company for the week ending Saturday, March 22, 1873.

	WEEK.	SEASON.
North	23 396 05	512,403 08
South	5,045 14	70,160 08
Total 1873	28,441 19	582,563 16
Corresponding time in 1872:		
North	35,324 07	537,883 19
South	4,310 19	74 061 13
Total	39,635 06	611,945 12
Increase North		
Decrease North		
Increase South		
Decrease South		
Increase		
Decrease	11,193 07	29,381 16

Delaware Lackawanna & Western Rail Road Company.

Coal transported on the Delaware, Lackawanna, & Western Railroad for the week ending Saturday, March 22, 1873.

	WEEK. Tons.	Cwt.	YEAR. Tons.	Cwt.
Shipped North	10,759	04	141,068	13
Shipped South	36,789	09	429,128	03
Total	47,548	13	570,196	16
For the Corresponding time last Year:				
Shipped North	6,717	11	142,748	00
Shipped South	33,676	03	439,716	18
Total	40,393	19	582,464	18
Increase	7,154	14		
Decrease			12,268	02

Prices of Coal by the Cargo.

(CORRECTED WEEKLY.)

	AT NEW YORK. March 27. R. A.	W. A	AT PHILADELPHIA. March 27. R. A.	W. A.
SCHUYLKILL.				
Lump	$- —	$5 75	— —	4 00
Steamer	— —	5 35	— —	4 00
Broken	5 60	5 35	4 25	4 00
Egg	5 75	5 50	4 40	4 15
Stove	5 95	5 65	4 60	4 30
Chestnut	5 10	5 85	5 75	3 50
Pea	— —	— —	— —	— —
LEHIGH.				
Freight to New York 50 cents.				
Lump, (on board)	— —	5 25	— —	— —
Broken	— —	5 20	— —	— —
Egg	— —	5 20	— —	— —
Stove	— —	5 60	— —	— —
Chestnut	— —	4 25	— —	— —
Pea	— —	— —	— —	— —
SPECIAL COALS.				
Honey Brook, Le'h W.A.	4 60@5 50		— —	— —
Spring Mountain " "	— —@— —		— —	— —
Sugar Loaf " "	— —@— —		— —	— —
Old Comp'y's " "	4 60@5 50		— —	— —
Room Run " "	4 60@5 50		— —	— —
Hill & Harris " "	4 60@5 50		— —	— —
Shamokin " "	4 60@5 50		— —	— —
Lykens Valley " "	4 75@6 00		— —	— —
Broad Top " "	6 50@— 00		5 25	— —

Company Coals.

March, 1873.

	L.	Str.	Gra.	Eg.	Sto.	Chest
*Scranton at E. Port	4 25	4 25	4 45	4 65	5 50	4 25
Pittston at Weehawken	4 70	4 70	4 70	4 90	5 40	4 60
*Lackawana at Weehawken	4 60	4 70	4 80	5 05	5 50	4 60
Wilk'b're at Hoboken	4 45	4 55	4 65	4 65	5 35	4 45
Old Co. Lehigh at Pt. John'n	5 25	—	4 85	4 90	5 15	4 15
Lehigh at Eliz. Port	5 00	—	4 75	4 75	5 10	4 15

For freights to different points see "Freights."
*To contractors only.

Prices at Baltimore—March, 1873.

Wholesale Prices to Trade.

Wilkesbarre, by cargo or car load	$5 75@6 00
Pittston and Plymouth, do	5 75@....
Shamokin Red or White Ash, do	6 00@6 25
Lykens Valley Red Ash, do	....@5 50
By retail, all kinds per ton of 2,240 lbs	7 50@8 50
George's Creek and Cumberland f. o. b. at Locust Point for cargoes	....@5 00
Fairmont and Clarksburg gas f. o. b. at L. Point	6 40
Kanawha Cannel, coarse	@12 00
BITUMINOUS COALS.	
Kittaning Coal Co.'s Phœnix Vein, f. o. b. at Phila	$
Lemon " " "	
Cumberland Vein Coal	....
Newburgh Orrel f. o. b.	$7 00
Tyreonnel f. o. b.	$7 00

Prices at Georgetown, D.C., and Alexandria, Va.

March, 1873.

George's Creek and Cumberland f. o. b. for shipping	$4 60@....

Prices at Havre de Grace, Md.

March, 1873.

Wilkesbarre and other White Ash for Cargoes	$ @4 75
Lykens Valley	@5 75
Shamokin Red or White Ash	5 00

Bituminous Coals (Cumberland).

Georgetown, F.o.b.	$4 60
Baltimore "	5 00
New York "	7 50

Prices of Foreign Coals.

March, 1873.

Duty 75 c. per ton.

Corrected weekly by ALFRED PARMELE, No. 32 Pine street, N. Y.

Liverpool Gas Caking	Nominal.
" " Cannel	15 00@16 50
" House "	22 00@23 00
" Orrel	17 00@18 00

Per ton 2,240 lbs., ex-ship.

PRICES FROM YARD.

Liverpool House Orrel, screened	$20 00@22 00
"Cannel, "	23 00@25 00

Per ton 2,000 lbs. delivered.

Prices of Gas Coals.

March, 1873.

PROVINCIAL.

Corrected weekly by Louis J. Belloni, Jr., 41-43 Pine st., N. Y

	Coarse	Slack.
Block House	$2 00	$1 00
Gowrie	1 75	— 80

Corrected by Bird, Perkins & Job, 27 South street.

	Coarse.	Culm of Coal,
Pictou nett	$2 25	1 25
Sydney	2 25	- 80
Lingan	1 75	- 80
Caledonia	1 75	- 80

A discount from the prices of the coarse Coal on purchase of 5000 tons and upwards. Duty on all slack coal or Culm: 40c. per ton of 28 bushels, 80 pounds to the bushel. On all bituminous coal or shale: 75 cents per ton of 28 bushels.

AMERICAN.	Nominal quo. Currency.
Westmoreland	$7 10 @— —
Fairmount Gas Coal Co. of N. Y	7 00 @— —
Despard Coal Co	7 00 @— —
Penn	7 10 @— —
Newburg Orrel Gas	— — @— —
West Fairmount Gas Coal	7 00 @— —
Redbank Cannel, Penn	— — @— —
AT PHILADELPHIA.	
Westmoreland	7 00 @— —

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven Lump and St., net, $1 60; Br., Egg and Ch., $1 65; Stove, $1 75
Shipping at Pt. R., 20c., for use at Phil., $2 18 from Pt. Carbon.

MAUCH CHUNK TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Phillipsburgh	$0 72
C. R. R., N. J., Phillipsburgh to Elizabethport	1 06
Shipping expenses at Elizabethport	25
Wharfage	10
Total	$2 3

MAUCH CHUNK TO PORT JOHNSTON.

L. V. R.R., or L. & S. R.R. from M. C. to Phillipsb'g	$0 72
C. R. R., of N. J., Phillipsburgh to Pt. Johnson	1 06
Shipping expenses	25
Wharfage	10
Total	$2 23

TO HOBOKEN.

L. V. R. R., Mauch Chunk to Phillipsburgh	72
Morris & Essex R. R. Phillipsburgh to Hoboken	1 06
Shipping expenses	25
Wharfage	10
Total	$2 23

TO SOUTH AMBOY.

L. V. R. R.	72
B. & D. R. R. / Cam. & Am. R. R.	1 06
Shipping Expenses	25
Total	$2 23

PENN HAVEN TO ELIZABETHPORT.

L. V. R R. Penn Haven to Phillipsburgh	0 84
C. RR. of N. J. Phillipsburgh to Elizabethport	1 06
Shipping expenses	15
Wharfage	20
Total	$2 25

Foreign and Provincial Freight

March, 1873.

Foreign.
Newcastle and Ports on Tyne, per keel of 21 1-5 tons 5/
Liverpool, 5 per cent primage

TO NEW YORK.

Provincial.	
Sydney	$3 05
Lingan	3 50
Cow Bay	3 75
Port Caledonia	3 10
Little Glace Bay	3 00

TO BOSTON.

Sydney	3 00
Lingan	3 00
Cow Bay	3 00
Port Caledonia	3 00
Little Glace Bay	2 90

Freights.—March, 1873.

TO EASTERN PORTS.	Cumberland. From Georgetown.	Cumberland. From Baltimore	Anthracite. From Philada'a.	From Elz. Port, Port Johnson, and Hoboken.	From Newburgh.	From Rondout.
Amesbury						
Bangor		4 50				
Bath		4 00		2 60		
Boston	3 10	4 00		2 40		
Bridgeport	2 75	3 00		1 00		
Bristol				1 40		
Cohasset Nar'ows	2 25					
Derby						
Dighton	2 85					
East Cambridge						
Fall River	2 75	3 00		1 40		
Hackensack						
Hartford		4 00				
Hoboken	2 10	3 75		50		
Jersey City	2 10			50		
Lynn						
Middletown						
Mystic				1 50		
New Bedford	3 00	3 50		1 40		
Newburyport	3 10	4 12		2 80		
New Haven	2 75	3 00		1 00		
New London	2 75	3 00		1 20		
Newport	3 30			1 40		
New York	2 25	2 25		50		
Norwalk	2 50	3 25		1 00		
Norwich		3 00		1 45		
Pawtucket		3 50		1 60		
Portland	3 25	4 00		2 40		
Portsmouth, N.H		4 12		2 55		
Providence	2 75	3 00		1 40		
Rockport						
Saco						
Sag Harbor				1 30		
Salem	2 70	4 00		2 40		
Stamford				1 00		
Stonington				1 50		
Taunton				2 00		
Warren				1 4		
TO RIVER PORTS						
Albany						
Catskill						
Cocksackie						
Coeyman's						
Cold Spring	2 30					
Fishkill						
Haverstraw						
Hudson	3 25					
New York						
Nyack	2 25					
Poughkeepsie	2 50					
Rhinebeck						
Rondout						
Saugerties						
Sing Sing						
Stuyvesant						
Tarrytown						
Troy	3 00					
West Point						
Yonkers						

St. Thomas	$— — Gold.
Martinique	— —
Demerara	— —
New Orleans	— —
Mobile	— —

MARKET REVIEW.

NEW YORK, March 27, 1873.

IRON—The market for Scotch Pig continues very quiet, with no disposition on the part of importers to press goods, as the stocks continue light and little or none on the way. The threatened strikes have a tendency to deter consumers from entering the market, and their purchases are altogether to meet present needs; we quote Eglinton $55, Glengarnock $56a58, Gartsherrie $60, and Coltness $65; we note sales of 100 tons Glengarnock, from yard, at $58, cash; 100 do. Eglinton, 100 do. Glengarnock, and 500 do. Eglinton at Philadelphia, on terms not made public. For American Pig the market is steady and firm at $50 for No. 1; No. 2 and Gray Forge, which have been somewhat neglected, have been in more inquiry, and sales have been made of 4500 tons Gray Forge, at the furnace, at about $40, part time; 100 do. No. 1 Carbon $50; 100 do. No. 2 do. $47, and 100 do. No. 2 Thomas, $48. New English Rails have been in more inquiry; about 2000 tons 56 lbs. have changed hands at $70 gold, which is considerably below cost of importation. New American are quiet at $80a83 currency, without sales. Old English are in good inquiry, with sales of 300 tons D. H., to arrive, at $59, time and interest added; and 300 do. T., $55, cash. In Scrap, we only hear of small parcels at about $55a57.50, from yard.

LONDON, March 11.—From the monthly circular of S. W. HOPKINS & Co.:—

EXPORT OF RAILS FROM GREAT BRITAIN.

	Month ending 28th Feb.		2 mos. ending 28th Feb.	
	1872.	1873.	1872.	1873.
To United States.....tons.	53,131	21,063	88,430	48,931
All other countries.....	18,230	20,255	42,779	42,650
Total.....tons.	71,361	41,318	131,209	91,551
Old Iron to all Countries..	6,270	7,361	11,914	13,748
Pig Iron to United States	14,902	10,079	22,897	19,110

LEAD—Pig remains firm, with a fair demand; sales have been made of 150 tons, mostly Ordinary Spanish, at 6¾@6¾ cents, and 200 do. Domestic 6¾, all gold. Bar 9¼ cents, Sheet and Pipe 10½, and Tin-lined Pipe 16½, less 10 per cent. to the Trade.

COPPER—New Sheathing is steady at 43 cents, and Bolts and Braziers 46, Bronze and Yellow Metal Sheathing 27, and Yellow Metal Bolts 32, net cash. In Ingot there has been less activity in "futures," while the demand for immediate delivery is still confined to small parcels to supply immediate wants; in this way we notice 125,000 lb. Lake at 34½ cents. The transactions in Tennessee noted in our last, should have read 750,000 lb., not 75,000 lb. as misprinted. We have learned since that the contracts were close on to a million of pounds for delivery through all the year at 31 cents. English is firm at the late improvement, with sales of 100 tons B. S. at 30¼a30½ cents, 30 days. 10,000 lbs. old Copper, Brass, &c. sold on private terms.

SPELTER—Is in moderate demand and firm at the recent advance; 45 tons Silesian sold at 7⅛ cents gold. Domestic 9 cents currency.

TIN—Since the large business in Pig, noted in our last, the market has been quiet, and, with a subsidence of the demand, there is less disposition to insist upon the previous extreme asking prices; here and there purchases can be made from stocks laid in at low price at figures below those generally demanded; we have only to notice the sale of 175 slabs Malacca at 33¼ cents. The bulk of the stock, however, is held firmly at 33½ cents for Straits, 33 for English, and 38 for Banca, all gold. Plates have been much less active; but prices generally are firm, particularly for Charcoal; Coke, however, are rather dull; this market does not respond fully to the English accounts; Sales have been made of 500 bxs. Charcoal Tin at $12.50 for I. C.; 500 do. Coke Tin, 14 by 20, 10.62½; 250 do. 10 by 14, $10.75; 2000 do. Charcoal Terne, part $11; and 500 do. Coke Terne $10, all gold.

ZINC—Mosselman Sheet is steady at the advance noted in our last, viz. 10 cents, less 4 per cent. gold, from agents' hands. Manganese black oxide 3½, do. gray peroxide 5½.

METALS.

NEW YORK, March 20, 1873.

IRON.—Duty: Bars, 1 to 1¼ cents ₱ lb; Railroad, 70 cents ₱100 lbs.; Boiler and Plate, 1½ cents ₱ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ₱ lb; Pig, $7 ₱ ton; Polished Sheet, 3 cts. ₱ lb; Galvanized 2¾; Scrap Cast, $6; Scrap Wrought, $8 per ton. All less 10 per cent. No Bar Iron to pay a less duty than 35 per cent. ad val.

	Store Prices.
Pig, Scotch—Coltness ₱ ton	— —@65 00
Gartsherrie	— —@60 00
Glengarnock	56 00@58 —
Eglinton	55 00@— —
Pig, American, No. 1	50 00@— —
Pig, American, No. 2	47 —@48 00
Pig, American, Forge	40 00@43 00
Bar Refined, English and American	— —@110 00
Bar Swedes, assorted sizes (gold)	120 00@130 00
Bar, Swedes, 1¾ to 5 x ⅜ & ⅞ 2 sq. & 6 to 12 x ⅜ & ¾	150 00@160 00
Bar, Refined, ¾ to 2 in. rd. & sq. 1 to 6 in. x ⅜ to 1 in.	107 50@— —
Bar, Refined, 1½ to 6 by ½	— —@112 50
Bar, Refined, 2¼ to 2¾ round 1 & 1¾ by ¼ & 5:16	115 00@— —
Large Rounds	115 00@127 50
Scroll	130 00@160 00
Ovals and half-round	132 50@152 50
Band	— —@125 00
Horse Shoe	— —@127 50
Rods, ⅜ to 3-16 inch	112 50@155 00
Hoop	155 00@180 00
Nailrod	@ 9¼
Sheet, Russia, as to assortment (gold)	16 @ 16¼
Sheet, Singles, D. and T. Common	—6¾@— 7¾
Sheet, D. and T. Charcoal	—7¾@— 8½
Sheet, Galv'd, list 5 per cent. discount	—@— —
Rails, English (gold), ₱ ton	70 00@ 72 00
Rails, American, at Works in Pennsylvania, currency	80 00@ 83 00

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper 4 cents ₱ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ₱ lb	— @— 43
Copper Bolts	— @— 45
Copper Braziers, 16oz. and over	— @— 45
Copper Nails	— @— 45
Copper, Old Sheathing, &c. mixed lots	28 @— 30
Copper, Old, for chemical purposes, 14@16 oz.	— @— —
Copper, American Ingot	34½@— —
Copper English Pig	30¼@— 30½
Yellow Metal, New Sheathing & Bronze	27 @— —
Yellow Metal Bolts	— @— 32
Yellow Metal Nails	27 @— 30

LEAD.—Duty: Pig, $2 ₱ 100 lbs.; old Lead, 11¼ cents ₱ lb. Pipe and Sheet, 2¾ cents ₱ lb.

Galena, ₱ 100 lbs	$— —@— —
Spanish (gold)	6 62½@6 75
German, do.	6 62½@6 75
English do.	6 75 @7 12½
Bar.....(net)	9 25 @ —
Pipe.....(net)	— —@10 50
Sheet	— —@10 50

STEEL.—Duty: Bars and ingots, valued at 7 cents ₱ lb or under, 2¼ cents; over 7 cents and not above 11, 3 cents ₱ lb; over 11 cents, 3½ cents ₱ lb, and 10 ₱ cent ad val. Store prices.

English Cast (2d and 1st quality) ₱ lb	— 18 @— 22
English Spring (2d and 1st quality)	— 9½@— 10½
English Blister (2d and 1st quality)	— 11½@— 16
English Machinery	— 11½@— 14
English German (2d an 1st quality)	— 11¾@— 12
American Blister "Black Diamond"	— —@— 11½
American, Cast, Tool do.	— —@— 17
American, Spring, do.	— —@— 11
American Machinery do.	— —@— 11¾
American German, do	— 9 @— —

TIN.—Duty: Pig, Bars, and Blocks, 15 ₱ cent. ad val.; Plate and Sheets and Terne Plates, 25 ₱ cent.; Roofing 25. ad val.

	Gold ₱ lb.
Banca	38 @38
Straits	33¼@33½
English	33 @—

PLATES.

Fair to Good Brands.	Gold.	Currency
I. C. Charcoal, ₱ box	$12 00 @12 50	$14 25 @14 75
I. C. Coke	10 50 @11 00	12 50 @13 00
Coke Terne	9 00 @10 00	10 75 @11 87½
Charcoal Terne	10 75 @11 25	12 75 @13 25

SPELTER—Duty: In Pigs, Bars & Plates, $1.50 p. 100 lbs.

Plates, Foreign.....(gold)	7 75 @—7 87
Plates, Domestic	8¾@—10½

ZINC—Duty: Pig or Block, $1.50 per 100 lb.; Sheet 2½c. per lb. Sheet.....per lb.—10½@11 ₱

San Francisco Stock Market.

BY TELEGRAPH.

NEW YORK, March 27th, 1873.

The following, from the San Francisco Stock Board, is dated March 24th. Without exception, the list has declined. Eureka G. V. is appendod to the report as selling at $19½.

	March 25.	
Savage	— 37	—
Crown Point	— 84	—
Yellow Jacket	— 54	—
Kentuck "New Issue"	— 7½	—
Gholiar Potosi	— 44	—
Gould & Curry "New Issue"	— 9	—
Belcher "New Issue"	— 64	—
Imperial	— 5½	—
Raymond & Ely	— 61½	—
Meadow Valley	— 19½	—

American Institute of Mining Engineers.

OFFICIAL BULLETIN.

Announcements to Members and Associates.

I. All members and Associates who pay their dues ($10,) for each current year, strictly in advance, will have sent to their address, regularly and weekly, the ENGINEERING AND MINING JOURNAL, which is the organ of the Institute, and will contain the proceedings and transactions, and all important papers read before the Institute and all notices of meetings. Back numbers cannot, as a general rule, be sent.

Those members and associates who have not paid their dues for the current year, are requested to do so at once. Money may be sent in postal orders, checks or bank bills, to the Secretary, THOMAS M. DROWN, 1123 Girard street, Philadelphia, Pa.

II. It is expected that the more important papers, read before the Institute, and the debates thereon, will be published in annual or occasional volumes to which those Members and Associates will be entitled who have paid their dues.

III. All authors of papers are requested to notify the Secretary in advance of the meetings, giving the subject and length of their papers. Attention is also called, in this connection, to Rules 12 and 13.

IV. The ninth rule has been amended, so that there will be hereafter three meetings a year, in February, May and October.

THOMAS M. DROWN, Secretary.

1123 Girard street, Philadelphia, Pa.

MISCELLANEOUS.

The Largest Organ Establishment in the World.

SEVEN EXTENSIVE FACTORIES.

J. ESTEY & COMPANY,

BRATTLEBORO, VT., U. S. A.

THE CELEBRATED

ESTEY COTTAGE ORGANS.

The Latest and Best Improvements.

Everything that is new and novel. The leading improvements in Organs were introduced first in this establishment.

ESTABLISHED 1846.

SEND FOR ILLUSTRATED CATALOGUE.

April 1:6m

EDWARD SAMUEL,

Iron Broker and Commission Merchant,

332 WALNUT STREET, PHILADELPHIA.

Solicits consignments and orders to purchase or sell American or Foreign Raw or Manufactured Irons.

Dec, 31:tf

DROWN & CORLISS,

ANALYTICAL CHEMISTS

AND

CONSULTING METALLURGISTS.

1123 GIRARD STREET,

PHILADELPHIA.

THOMAS M. DROWN. GEORGE F. CORLISS,

ALX. TRIPPEL, C. E.,

MINING ENGINEER

AND

METALLURGIST.

ISIDOR WALZ, Ph. D.

ANALYTICAL

AND

CONSULTING

CHEMIST.

No. 18 EXCHANGE PLACE,

NEW YORK.

RICHARD P. ROTHWELL,

MINING ENGINEER

ROOMS 107, 108, 109,

71 Broadway, New York.

COAL AND IRON A SPECIALITY.

P. O. Box 2487 N. Y.

MAYNARD & VAN RENSSELAER,

Mining and Metallurgical Engineers,

Experts in Iron, Analytical Chemists,

24 Cliff Street, New York.

GEO. W. MAYNARD, SCHUYLER VAN RENSSELAER.

SITUATION WANTED.

As Manager or Superintendent on Mines, Smelting or other Works, an able and experienced man, correct accountant, accustomed to large pay rolls. Best reference. Address W. J., office of this paper. April 1.tf

A METALLURGIST OF CHARACTER AND ability is now open to engagement. Thoroughly familiar with the complete metallurgy of lead, silver, gold, antimony, etc., and competent to erect and manage reduction and technical works of any magnitude. First-rate Assayer and Analytical Chemist. References if desired. Address METALLURGIST, San Francisco, Cal.

WOOD ENGRAVING

EXECUTED AT THE OFFICE OF

The Engineering and Mining Journal.

27 PARK PLACE, NEW YORK CITY.

Modern Alchemists.

Dr. OTT, in an address before the Polytechnic Branch of the American Institute, on this subject, said: Most of those I now address have doubtless noticed, that among the people following certain avocations, there are classes who in their respective callings still cling to the old prejudices and errors of bygone times. We still find, for instance, a class among the doctors believing that the human system is capable of transforming one element into another—*i.e.*, that sulphur may be converted into phosphorus, and the like. Among students of zoology and botany, we find some who still hold to the doctrine of the immutability of species, and there are yet physicists who cling with wonderful tenacity to the hypothesis of two imponderable fluids and an imponderable caloric fluid. The chemical fraternity, I am sorry to say, is not free from such adherents to the old school, and I have found among them a certain class, who by their ignorance of chemical principles, the skill they display in mingling the most heterogeneous elements, and the complexity of their formulæ, are worthy of the highest degree of honor ever bestowed upon the disciples of GEBER and RAYMONDUS LULLUS—viz., that of the title *Doctor Illuminatissimus* and *Doctor Mirabilis*. But while the old alchemists, either by good luck or by inventive genius, really enriched the world by valuable discoveries, such for instance as the discovery of porcelain by BÖTTICHER, the modern alchemists thus far can only show bombastic descriptions relating to their recipes and formulæ."

Dr. OTT continued that for the study of modern alchemistry, he was greatly indebted to the specifications of the Patent Office in Washington, D. C., and he believed them to be as indispensable for the investigation of this subject as the Imperial Library in Paris is for the researches concerning Arabian alchemists, or as the library of Leyden for the perusal of the treatises of GEBER and ALBERTUS MAGNUS. He ought to remark that the modern alchemists enjoyed that great advantage over their earlier brethren, that they were protected by their governments—a privilege that the ancient alchemists did not enjoy. For the present, he would only treat of those alchemists who had devoted themselves especially to the discovery, not of the philosopher's stone, but of "artificial stone." At some future time he hoped to be able to treat of the "steel doctors," comprising quite an ingenious class, who pretend to be able to convert inferior iron into steel by surface-hardening. He would also speak of those well-meaning adepts in the art of wood-preserving, inasmuch as there were some of them, who, having read of the mountaineers of Styria, who habitually eat arsenic with great benefit, it is said, now propose to introduce arsenic in homœopathic doses into the lungs of the inhabitants of cities or villages by laying wooden pavements saturated with *arsenical solutions!*

The speaker then took up about fifty specifications of patents granted for artificial stone during 1870, '71 and '72, and proved in every case, to the great delight of the audience, that there was not one among them that deserved credit for either novelty or utility, or both combined. He then read a number of abstracts from the daily as well as from the scientific press, from pamphlets and books, speaking of those alleged innovations in high-flowing language, thus showing what means are resorted to by those dabblers in chemistry, to inveigle capitalists into their schemes. The question which he then put: "Is the easy granting of letters patent, as now practised in the Patent Office, an evil or not?" was answered in the affirmative. Taken all in all, the paper was very meritorious, and when published in full in the "transactions," is likely to improve the tone of patent stone men.

Mushet's Special Steel.

Mr. GRUNER, Inspector General of Mines in France, has been analysing Mushet's "special" steel," to which the inventor gave the *alias* Titanium Steel. He finds there is no titanium in it, or only traces. Its composition is: Tungsten 7·98, carbon 1·40, silicon 0·24 per cent. M. GRUNER therefore looks upon it as a true alloy of tungsten and iron, containing nearly 8 per cent of the former. Mushet's steel, as is well known, is extremely hard, and does not temper by the ordinary treatment. Ten years ago Messieurs GRUNER & LAN collected all the attainable facts in relation to tungsten steel and found that, up to the proportion of 3 per cent., tungsten increases both the hardness and tenacity of steel; but beyond that proportion the tenacity decreases, while the hardness continues to increase. With 6 per cent. a bar of steel became as brittle as glass. The question thus arises, by what process this defect is remedied in the preparation of Mushet's Special Steel. This M. GRUNER believes to be by the use of a very pure steel, made from a very superior quality of iron; tungsten being reduced with cemented steel made from the finest Swedish brands of iron. This, at least, is the process now and for a long time followed at the Maisons-Alfort Ironworks for the manufacture of tungsten steel, by M. MAZELINE FILS and his predecessor, M. MICOLON, at St. Etienne. Certain it is that Mr. MUSHET's reputation as a skillful metallurgist will be increased by the fact that he knows how to produce from tungsten and iron a steel of great value for special uses. Its hardness fits it for the manufacture of tools, and at least two firms in England have commenced its use.

In making some experiments to prove that dynamite is not a dangerous substance to transport on railways, Mr. NOBLE, well known in connection with the introduction of nitro-glycerine, displayed his somewhat extraordinary powers of invention. He wanted to drop a mass of iron on a box of cartridges, but had no way of cutting the cord which held the iron. He finally determined to make a cartridge of dynamite serve as a cutting tool, and for this purpose the cartridge was secured to the rope immediately above the iron block. A Bickford time fuse, terminated with a powerful percussion cap, was inserted into the cartridge, and in two or three minutes (the block of iron being meanwhile hoisted to the top of the tower, and the rope made fast), a loud and sharp explosion occurred; the rope was cut, and the iron ram fell exactly on the spot desired.

The Gold and Silver Yield of Montana.

From the forthcoming Report of the U. S. Commissioner of Mining Statistics.

THE collection of the mining statistics of this Territory for 1872, I have entrusted to Mr. WILLIAM F. WHEELER, of Helena, Montana, whose extensive acquaintance in the Territory has enabled him to send me detailed estimates of the product, and, considering the means at his command, very full data in regard to the several districts. His estimates of the yield of gold and silver of Montana for the year 1872 are derived from shipments by express, from purchases made by bankers, brokers and merchants, and from miners and others, who have not shipped by express, and who have given him what they believe to have been the yield of their several mining districts:

Gold shipped by WELLS, FARGO & Co.*	$3,471,395
" from Missoula, by "pack-trains," to Walla Walla	200,000
" taken out of the country in private hands, overland and down the Missouri †	1,500,000
" " retained in hand by miners for winter expenses	550,000
Total gold	$5,721,395

SILVER.		
Refined silver bars shipped by express	$97,944	
220 tons base bullion, shipped by wagon to Corinne, value $500 per ton	110,000	
60 tons base bullion, shipped East, *via* Fort Benton, at $500 per ton	30,000	
410 tons silver ore,‡ shipped by wagon to Corinne, value $200 per ton	82,000	
135 tons silver ore, shipped East—75 tons *via* Fort Benton, and 60 tons by wagon to Corinne—value $200 per ton	27,000	
		$346,944
Value of copper ore shipped for assay		5,000
Total coin value		$6,073,339

The foregoing estimate is accompanied with the following certificate from leading citizens of Montana, which refers to the estimate for the previous year also:

The undersigned, citizens of Montana, have examined the data upon which the foregoing estimates are based, and are satisfied that Mr. WHEELER has made a very moderate statement of the gold and silver yield of Montana for the year 1872. We have also examined his report for 1871, and consider his estimate of $8,050,000, as the yield for that year of gold and silver from the mines of Montana, as very correct.

D. C. CORBIN, Cashier of the First National Bank, Helena.
T. H. KLEINSCHMIDT, Assistant Cashier, do.
GEORGE W. FOX, of FOX, LYSTER & ROE, Bankers.
L. H. HIRSCHFELDT & BRO. "
R. E. FISK, Editor of the Helena *Herald*.
D. S. WADE, Chief Justice.

I am confident that the above estimate is largely *under* the actual yield.

S. T. HAUSER, President First National Bank.

* In regard to this item, Mr. WHEELER says: "I have taken the actual shipments by "express" of gold dust and refined silver bars. But I find by inquiry of the several banks and brokers that they have *purchased* nearly half a million more than the amount reported *shipped* by express in the Territory. The contracts of the banks in the Territory with the Express Company begin with May 1, 1872, and end with May 1, 1873. The bankers all say they will be able to fulfill their contracts, as they have four months to make shipments in; therefore, the amount will have to be furnished from the yield of 1872, and I am thus justified in adding that sum to the amount named as the yield for 1872 in my report, which will make the total yield of the Territory for 1872 upwards of $7,000,000."

[I quote the above statement, without adopting the suggestion, since it seems to me that there would be no fairness in adding the first shipments of 1873, on the ground that they contained product of 1872, to an aggregate which, by the same reasoning, must contain a part of the product of 1871. I have, therefore, retained the original figures, representing simply the shipments of 1872.—B. W. R.]

† On this point Mr. WHEELER says: "Towards autumn, after the season's work in our placer mines is done, large numbers of miners go to Utah, Nevada and California, to seek employment for the winter in the numerous silver and gold quartz mines there, and return in the spring to work their placer mines here. They generally go in companies of ten to twenty, and carry with them the product of their past summer's work, in order to avoid 'express charges,' which are from two to three per cent., and for mutual protection. The sums they take away are large in the aggregate, and the express company is the least likely to know the amounts, in the case of travelers by the coaches, since the express company assume to charge for all gold carried by passengers in this way. Many passengers in the stages take from $1,000 to $5,000 with them secretly, to avoid paying these express charges. I know of one company of miners, who traveled by their own conveyance, and took out last fall $60,000. I doubt if I have sufficiently estimated the amount thus taken out by a quarter of a million. Much of this gold is sold in Utah, Colorado and California, and is deposited in the mints at Denver and San Francisco, and is not reported as the yield of Montana."

‡ Mr. WHEELER says: "There are, to my own knowledge, more than 3,000 tons of silver ore lying on dumps at the mines, and waiting for purchasers, or for spring to permit shipments, etc., of which I have made no account. This cannot properly be included, the value being uncertain, and the amount, whatever it is, sure to find a place in the aggregate for a succeeding year."

THE ENGINEERING AND MINING JOURNAL.

ROSSITER W. RAYMOND, Ph. D.
JOHN A. CHURCH, E. M. Editors.

PUBLISHERS' ANNOUNCEMENT.

THE ENGINEERING AND MINING JOURNAL *is projected in the intent of furthering the best interests of the Engineering and Mining public, by giving wide circulation to original special contributions from the pens of the ablest men in the professions. The careful illustration of new machinery and engineering structures, together with a summary of mining news and market reports, will form a prominent feature of the publication.* It is the Organ of the American Institute of Mining Engineers, and is regularly received and read *by all the members and associates of that large and powerful society, the only one of the kind in this country.* It is therefore the best medium for advertising all kinds of machinery, tools and materials used by miners or their employees.

SUBSCRIPTION—$4 *per annum in advance;* $2 50 *for six Months.*

ADVERTISEMENTS—*The rates are as follows: Inside pages,* 25 *cents per line each insertion; the outside or last page,* 40 *cents per line. Payment required in advance.*

NEWSDEALERS *will be supplied through the agency of the* AMERICAN NEWS COMPANY, *No.* 121 *Nassau street, New York City.*

COMMUNICATIONS *of all kinds should be addressed to the Secretary. The safest method of transmitting money is by checks or Post-office orders, made payable to the order of* WILLIAM VENTZ, *Correspondence and general communications of a character suited to the objects of* THE ENGINEERING AND MINING JOURNAL *will always be welcome.*

The Postage on THE ENGINEERING AND MINING JOURNAL *is twenty cents a year, payable quarterly in advance, at the office where received.*

THE SCIENTIFIC PUBLISHING COMPANY.

WILLIAM VENTZ, SECRETARY.
27 Park Place,
P. O. Box 4404. NEW YORK CITY.

CONTENTS FOR THIS WEEK.

The American Battery Mortar	193	Advertisements	199
The American Institute of Mining Engineers	193	Modern Alchemists	200
The Combustion of Water	194	Mushet's Special Steel	200
On a Mining Transit and Plummet Lamp.	195	The Gold and Silver Yield of Montana	200
The Use of the Plummet Lamp in Underground Surveying	196	EDITORIALS:	
The Fire-Proof Question	195	The Institute Election	201
THE COAL TRADE	197	The Princeton School of Science	201
THE MARKET REVIEW	199	The Emma in Trouble	202
San Francisco Stock Market	199	New Publications	202
The American Institute of Mining Engineers	199	MINING SUMMARY:	
		Nevada	203
		Utah	203
		Advertisements	204

It is not often that heavy machinery is made in America for use in Europe, and when such is the case there is presumptive evidence that the machinery is of unusual excellence. Several German engineers were sufficiently attracted by the description given in this journal, February 18th, of the Selden mining and water works pump, to order some of those machines for trial. We are informed by Mr. CARR, that he has considerable inquiry from Germany for his pumps. He had already made arrangements to exhibit them at Vienna, but the use of them in German mines will tell more effectively for American manufactures than a formal exhibition possibly could.

The Princeton School of Science.

Mr. H. B. CORNWALL, now of the New York School of Mines, has accepted the Assistant Professorship of Analytical Chemistry and Mineralogy in the School of Science of the College of New Jersey, better known as Princeton College. This institution, which has been long in process of organization, will open in September next. The programme which lies before us indicates that the object of the school is not so much to prepare students for immediate entrance into technical callings, as to afford young men a means for obtaining thorough instruction in the knowledge of natural laws, which is the result of so many centuries of cumulative study; and also, to train them in the methods by which that knowledge has been gained and is to be extended. It is in this last particular that a school of science differs from other institutions. The Superintendent of a grammar school gives his scholars daily information, and gives it off-hand, the accumulation of which has worn out the greatest brains that have existed. But there he stops, while that is only the starting point of the school of science, where knowledge is only a means and method of work is the real end. In a technical school that method is meant to be immediately applied, while in a school like that about to open at Princeton, its purpose is to start the mind upon the right path, and educate it to the power of properly comprehending present and future discoveries. But it has a still higher—or better, a more scientific purpose. The instruction which is meant to produce a liberal education in science, can be extended at will, to embrace close analytical investigation.

The course of study includes special sciences like astronomy, botany, chemistry, geology, and geographical, physical and philosophical science, together with other studies which are accessory to them. The appointment of Prof. CORNWALL, whose labors in connection with blowpipe investigation entitle him to be considered a specialist in that department, indicates that we are to have one more institution in this country where the use of that delicate, ready and accurate means of analysis is to be appreciated at its just value. American schools already hold the second place in blowpipe instruction, which is better here than in any other country outside of Germany, where PLATTNER and RICHTER placed it on its present basis. Mr. CORNWALL, as one of the most thorough and originative blowpipists in this country, will be able to give the Princeton school a leading place in the list of those which teach this method of analysis.

The Institute Election.

The eighth rule of the American Institute of Mining Engineers was copied from the corresponding rule of the North of England Institute; and will doubtless have to be amended at the next annual meeeting, to make it apply more conveniently to the different circumstances of the American body. But, such as it is, it controls the next election; and we purpose to say a few words concerning that election, premising that they convey our individual views only, and bear no official or semi-official character.

According to the rule, any member may nominate in writing at any time, and send to the Secretary, a list of candidates, signed with his own name. This signature is required to prevent anonymous nominations from persons not members; it will not be made public. All such lists received by the Secretary up to thirty days before the annual meeting—that is, in this year, up to April 22—will be combined by him, so as to make a single list, containing all the names suggested for each office; and this list, authenticated with the Institute seal, will be sent to each member or associate, who will strike out or add names, so as to leave a record of his vote for officers, sign the list and return it. But all this is merely for the convenience of members not attending the meeting. The object of it is that each shall have a chance to vote, and to know something of the persons proposed, so as not to vote entirely in the dark. Any member can send to the Secretary at any time before the election, or hand to the proper person at the time of the election, his ballot, signed with his name, to certify its genuineness—and for the superfluous purpose of preventing his voting twice!

The following ticket has been proposed by a number of leading members, after consultation, and will be sent to the Secretary. Our object in noticing it will be seen presently. It suggests for Vice Presidents: Messrs. COXE, BLAKE, BLANDY, ROTHWELL, EGLESTON, and PECHIN; for Managers: Messrs. MAYNARD, SYMONS, PRIME, CORYELL, HEWITT, FIRMSTONE, LESLEY, PETTEE, and HUNT; for Secretary and Treasurer, the present incumbents.

We have no objection to this ticket. It strikes us as an exceedingly good one. The change in Vice Presidents is due to the necessity of rotation. Under the present rule, none of them can hold that office more than three years: there is danger of a clean sweep at the end of that period, if all the first incumbents are retained. The Vice Presidents now remaining from the original election, are Messrs. COXE, SYMONS, BLAKE and BLANDY. One of these being changed to Manager by the above ticket, the other three will, if elected next May, be ineligible as Vice Presidents in May 1874, while, of those who have already held that position, Messrs. SYMONS and ROTHWELL will be eligible. It is of course desirable that the whole board should not be suddenly changed every three years; and hence we approve of minor changes annually, retaining or restoring the experienced elements.

Among the Managers proposed, we notice the new names of Messrs. FIRMSTONE, PETTEE and HUNT. Three Managers must go out, under the rule; and we think these gentlemen among the best that could be named for the vacant places.

So much for the ticket first proposed. We have discussed it briefly, with the main purpose of calling upon members and associates to send in other nominations to the Secretary, in time for distribution under the rule. While there is no objection to unanimity of choice, there is no desire on anybody's part to "cut and dry" the choice beforehand. Other nominations, therefore, if made in earnest, would be appropriate and welcome. We trust that the machinery of elections will be improved before another year; but meanwhile the best that can be done is to urge members to make the present system as effective as possible. To that end we suggest:

1. That members residing in remote districts make up and send to the Secretary at once their *ballots*, without waiting to receive any official list from him, which there might not be time to correct, sign and return.

2. That every member having preferences with regard to any of the offices, indicate them by nomination, at once. There is no lack of suitable names; and we are persuaded that there is no sensitiveness on the part of present incumbents which need prevent even a total change of officers. If the history of the Institute had been marked by intestine difficulties of any kind, there might be significance in the omission of one or another officer; but the harmony and success of the administration so far are universally acknowledged, and no considerations call for change, so far as we are aware, except the provisions of the rules, and the circumstance that so many other members besides the present officers are perfectly competent to take their turn in bearing the burdens of management. The great increase in the membership lends force to this consideration.

In the nomination of officers, however, it should be kept in mind by all that the interests of the Institute must be the controlling consideration. These require:

1. That the officers of the Institute shall reside in the eastern part of the country, or be able to attend the meetings of the Council. This unfortunately

excludes some of our most active and able members, whose residence or occupation prevents their attendance.

2. That the officers shall be distributed, as far as is consistent with the necessity just mentioned, among the different regions and occupations represented in the Institute.

3. The presence in the Council of representatives of the leading American mining schools tends to secure an important advantage in the form of accessions to membership from among the graduates of such schools. There is little danger that theory will be excessively pushed, to the exclusion of practice. Educated engineers are, as the proceedings of the Institute prove, as practical as anybody, and possess, besides, the ability to record and report intelligently the results of experiment. The more we have of them, the better.

Bearing these things in mind, we trust the members of the Institute will act independently and wisely in the nomination and choice of officers, under the present somewhat clumsy arrangement.

The Emma in Trouble.

The Emma mine has been in the hands of an English Company for somewhat more than a year, and according to British law an annual meeting of the shareholders, preceded by a report from the directors upon its condition, has been held. It is one of the most remarkable deposits of ore in this country, and will always hold its place in history among the great mines of the world. But the report of the directors disclosed a condition of affairs which is astounding. The company is more than £50,000 in debt, and this sum, at the present rate of profits, as calculated by some private authorities, corresponds to no less than three-quarters of a year's work. We refer to "private authorities," because the directors' report is not in our hands, and the sources of our information are the report of the public meeting, and a business circular from Mr. Thos. Thompson, Jr., both published in the *Mining World* and in other English papers.

When we look for the causes of this indebtedness, we find it due to two things: the Emma-Illinois legislation, followed by the buying up of the Tunnel Company's claim, for which there is £18,000 still owing; and a very remarkable *over issue of dividends*, amounting to not less than £33,000 or £34,000, and corresponding to two months' dividends at 1½ per cent. The directors present very lame excuses for this remarkable feature of the case, and excuses must necessarily be lame when they have to account for negligence in the management of a property for half of which £500,000 was paid, and the earnings of which in the beginning promised £800,000 a year. Of course, this falling off in the receipts is the dangerous element in the Company's affairs. It is due to a decrease, not in the amount of ore, but in its value. So far as we know, the reports about the wonderful *bulk* of the deposit are not extravagant. But its tenor in silver and lead has failed sadly.

According to the statement of one of the shareholders, the prospectus, put out when the mine was placed in the English market, said the highest of sixteen assays gave a value of £45 16s., and their average was £37 10s. The latter at $4.84, corresponds to $181.50 The trial ore sent to England came up to this standard, and so did some of the ore raised by the new company, after the sale was consummated. But that state of things soon ceased. The operations of the company, as summed up by a shareholder, are as follows: 2,790 tons sent to England, realizing *gross* £29 10s. per ton; 6,532 tons sold in Salt Lake City, realizing *gross* £11 9s. 6d.; 550 tons sold in St. Louis, at £12 16s., but not yet accounted for. This is all first class ore; and we find no statement of the amount of second class ore raised by the company. The average gross value of the whole is somewhat less that £17, or $82.28 per ton. From this are to be deducted the expenses. These are £5 16s. per ton in Salt Lake City, or close on £37,785 on the ore sold there, and £16,180 on the ore sent to Europe; the latter had to bear a further transportation charge of £8 4s. per ton or £24,823, and also £12,421, the expenses of the London office. This brought down the *nett* return from the £29 10s. ore sent to Europe to about £14 10s, and from the ore sold in Salt Lake City to £6 3s. and £7 per ton.

The business of the company is summed up in the statement that they received from the vendors cash £46,300, and 2,800 tons second-class ore; and have raised or realized on 9,862 tons. The 12,662 tons of ore are put down as worth £139,357, or total cash £185,657. But this is not the work of the mine during the thirteen months. *That* represents 9,862 tons of ore from which the nett yield is somewhat less than £74,000! This gives but 7½ per cent. interest, and in estimating the position of the company, it is not to be forgotten that it has a debt of more than fifty thousand pounds, which will, as we said before, require the continuous profits of nearly nine months for its liquidation. The most the company has to look forward to is that after working a year more it will have £20,000 in its locker, or a dividend for one and a third months at the present rate of payment.

The falling off in the value of the ore amounts to $99.22 a ton, or $181.50, their estimated value, less $82.28 (£17), the real selling price. While the ore has declined in value, the expenses have been more than double what was estimated. Hauling the ore from the mine has cost £17,865, railroad freights to New York £28,804, steamer freights £397, re-insurance £460, English commissions £1,194—items which we give for the benefit of future projectors. The total expenses were about £17 per ton. They had been estimated at £8 15s. The figures we have used are those of stockholders, and being to some extent round numbers, do not tally exactly. But they are sufficiently correct to present an accurate idea of the company's position, and the two great facts interesting to all who deal in American mines—namely, that the ore is wort much less that was anticipated, and that the cost of transportation is about as much higher than the expected cost, as the value is less than the expected value.

Under these circumstances it is not surprising that the profits of the company have been 7½ percent., instead of 18. But there is one circumstance which, we think, was not brought out with sufficient clearness at the meeting. The falling off in the ore, and the excess of real expenses over those which had been calculated upon, were known very soon after the company took possession of the works. The directors have known for months that they were earning only 7½ per cent., though they kept on paying 18 per cent. There was a good deal said at the meeting about the honesty of American sellers. We do not defend them. But we want to know what the 2,300 shareholders composing the Emma Company think of directors who could pretend that their earnings were at the rate of £180,000 a year, when they were really earning only £75,000. The question is, where did they get the money to make up the difference? The *exposé* shows that it was advanced by their American agent, who is now their creditor for nearly £34,000, and was also drawn from the £46,000 accumulated earnings bought with the mine. We have said before that these figures do not tally. Whether they are wrong in themselves, or whether there are revelations yet to come, we do not know. The Emma shares are now selling at 9 to 10, par being 20. This is a depreciation of two and a half million dollars from par, and of more than five million from the highest prices. When the company was formed, only one quarter, or £250,000, was taken up by *bona fide* subscribers. The remaining £250,000 of the half taken in England was subscribed for by a syndicate, leaving one-half the shares in the hands of the American sellers. The syndicate first sold out, and then the Americans, both at par or a premium. And now the English press and the shareholders are raving about the morality of Americans, and doing so in the very presence of the syndicate who sold out at a premium because the concern was paying 18 per cent. a year, and of the directors who consented to make it appear that the mine was earning the money.

The dazed and bewildered shareholders could think of no other explanation of their losses than to charge swindling upon all whom they had dealt with, *except* the English managers. The ore sold abroad averaged $143 a ton gross; that sold in Salt Lake City brought only $58 gross, and yet the ore was "first class" in both cases. They seemed to reason that, being first-class ore, it must have been of equal value throughout; and they could only account for the difference by supposing that the samplers or the assayers had swindled them. Statements were made, and were received with gravity by all present, that a very few dollars was sufficient to buy up an American. In all that company of men there was not one who was sufficiently versed in mining, or who had the boldness to inform the foolish shareholders that when ore is shipped from the center of one continent to the edge of another, it must be exceedingly rich to pay the expense; so rich, in fact, that there are but very few mines, indeed, in the world which can supply such ore even in small quantities; and that in the case of the Emma the ore sent to Europe was not only first-class, but *picked* first class, and that the ore sold in Salt Lake was the remainder, after taking out the ore for foreign shipment. Properly speaking, the Emma has produced three grades of ore: first class, sent abroad; second class, sold in Salt Lake City; and third class, poor ore, thrown on the dump.

We are confident our readers will agree with us in looking upon the condition of the Emma as one which it will be hard to explain satisfactorily. The disappointment attending the depreciation of the ore, and even the increase of expenses, may be explained; but they confirm the opinion we expressed at the time of the sale, that the property was too highly valued, in view of all the risks. The litigation may be no fault of the present owners, though the history of the Emma title was never perfectly clean. But the stock-jobbing operations and the bogus dividends are inexcusable; and, the *Mining World* will permit us to add, they are English.

NEW PUBLICATIONS.

Third and Fourth Annual Reports *of the Geological Survey of Indiana, made during the Years* 1871 *and* 1872, *by* E. T. Cox, State Geologist, *assisted by* Prof. John Collett, Prof. B. C. Hobbs, Prof. R. B. Warder *and* Dr. G. M. Levette. Indianapolis, 1872.

In the preface to this volume, Prof. Cox remarks with justifiable satisfaction upon the great impulse given to mining and manufacturing interests by the operations of the Indiana Survey. In Daviess County, for instance, lands which were rated at fifty and one hundred dollars per acre—after sixteen years of mining operations—have recently advanced to two and three hundred dollars, partly because of the degree af attention attracted from capitalists by the reports of the geologists and engineers, partly because the Survey has pointed out the existence of eight coal-seams, instead of one, and proved that five of these are locally of workable thickness.

Perry, Dubois, Pike, Parke, Dearborn, Ohio and Switzerland Counties have been surveyed in detail, and preliminary examinations have been made in Wabash, White, Jasper, Howard, Huntington, Miami, Cass, Carroll, Clark, Harrison and Crawford Counties. In addition to the reports of the corps on these localities, the volume contains an interesting article by Prof. E. D. Cope (first published, July 1872, in the *American Naturalist*) on the Wyandotte Cave and its fauna. This cave is in many respects equally beautiful and grand with the Mam-

moth Cave of Kentucky. There is no room in the latter which rivals the largest two in the Wyandotte. The living species in the two localities have many resemblances.

Among the most interesting features of Prof. Cox's report are the numerous coal analyses. We notice in this array a number of ultimate analyses, the significance of which will deserve notice hereafter.

The maps accompanying the report are on a sufficiently large scale, to show townships and smaller subdivisions; but they bear meager details only of geology and topography; and since they are neither colored nor shaded, it is difficult to get clear ideas from them, on these subjects. We find outcrops of different rocks laid down, sometimes in printed words, sometimes in dotted lines; but the dip of the strata is not indicated, and there are no profiles or sections to serve as keys. We presume these maps are merely provisional; and we trust the survey will be provided with the means of preparing and publishing something better.

BANCROFT'S GUIDE *for Travelers by Railway, Stage and Steam Navigation in the Pacific States.* San Francisco: A. L. Bancroft & Co.

This useful hand-book, which is published monthly, like the railway guides of the Eastern States, contains a large amount of useful information concerning routes, distances, fares, scenery, principal towns, etc. A glance at its maps and tables will give the reader a profound impression of the vast activity of travel and transportation which pervades the wide area of the Inland Basin and the Pacific coast. The excellent natural roads of the West permit it to be traveled in all directions by wagons and stages, almost as the sea is traversed by ships. The numerous mountain ranges are merely islands and promontories to be circumvented, or passed with the aid of convenient straits. In short, there are few points in our great interior where a man (other than a trapper or prospector) would care to go, that cannot be reached in company with WELLS, FARGO'S express-box and the United States mail-bags. The conquest of the wilderness has been silent, but thorough.

Professor TYNDALL'S *Lectures on Light* have been issued by APPLETON in a small, neat volume, which contains also his farewell speech at the famous Tyndall Banquet in this city. We need not repeat our high opinion of the man and his works; and certainly we need not urge the public to buy this book. The immense sale of the *Tribune* sheet, containing these lectures, has, we think, merely increased the number of those readers who will be glad to have them in more durable and convenient form. The *Tribune* edition, we must frankly say, being printed on brittle paper, goes to pieces after a couple of readings, though handled never so carefully.

THE ANCIENT STONE IMPLEMENTS, *Weapons and Ornaments of Great Britain.* By JOHN EVANS, F. R. S., F. S. A. New York: D. Appleton and Company, 1872.

The author of this book is Honorary Secretary of the Geological and Numismatic Societies of London, and has enjoyed peculiar advantages, both from his position and through the zealous co-operation of other archæologists, for the preparation of such a work. The title is too modest, and scarcely covers the scope of the volume, which comprises, in fact, an elaborate treatise on the so-called palæolithic and neolithic periods, and the remains of prehistoric culture ascribed to these periods, in all countries—those of Great Britain forming the basis of classification and comparison, and receiving, of course, the main share of attention. The bearing of these discoveries upon the question of the antiquity of the human race, and the inferences to be drawn from them concerning the nature of the earliest civilizations, are treated with critical acuteness, caution and candor; and the numerous admirable illustrations accompanying the text render it an intelligible collection of facts, as well as a complete summary of conclusions, in this fascinating department of science.

Statistical Report of the National Association of Iron Manufacturers, for 1872. THOMAS DUNLAP, Secretary, 341 Walnut street, Philadelphia.

Besides the statistics of which we have before given an extended view, this report contains a number of papers relating to the technology of iron manufacture. They are: The Danks' Rotary Puddling Furnace; Baynton's Rotary Puddling Furnace, intended to produce smaller blooms than the Danks; the Dormoy Revolving Puddle; Bromhall's Patent Puddler, a new form of machinery for moving the ordinary rabble, in the ordinary furnace; Westerman's Improvement in Reverberatory Furnaces; the Whitwell Hot Blast. These are all illustrated, and in addition to them there is an article on railway construction, copied from the *Chicago Railway Review.* This is concise and full of facts and figures. We wish we could speak as well of the long-winded extract from the *St. Louis Times* on the ore and pig production of Missouri. It, too, contains facts and figures enough, but for all its length it is incomplete, and what it presents of interesting material is so mixed up with trivial and incorrect details, that the members of the Pig Iron Association will probably tire down in reading it, long before they have culled the valuable part of it. The publication of discussions of technical interest is a good idea, but we hope that the secretary will strive to make his report a repertory of communications from practical men engaged in the occupations they are describing. These are at once the most valuable kind of reports, and also the most difficult to obtain. Mr. DUNLAP'S position gives him facilities for extracting information of this kind from the iron makers, which no other man in the country enjoys in equal measure. We hope that through him the neglected subject of American metallurgy may receive valuable additions.

Van Nostrand's Eclectic Engineering Magazine, April, 1872; $5 a year, 50 cents a number.

This number of VAN NOSTRAND'S well known magazine is of especial value to mining engineers, blast furnace men, and, indeed, all workers in iron. It contains the whole of SANDBERG'S translation of AKERMAN'S paper upon the generation of heat during the Bessemer process, a large part of Prof. FORBES' paper on the iron and steel industries of countries other than Great Britain, and a translation from Stölzel's Metallurgy of that author's remarks on the hardening, tempering, drawing and welding of steel. The engineering papers are also numerous and valuable. We particularly commend the publication of these papers in their entirety, notwithstanding their length, a method which every other technical magazine would do well to follow.

MINING SUMMARY.

Nevada.

(From our own Correspondent.)

EUREKA, Nev. February 28, 1873.

TO THE EDITOR:—At no previous period in our history has the business of this district been so depressed as at the present time. There are several reasons for this. The mines of the Eureka Consolidated and Phœnix Companies are not looking as well as they did a few months ago; a suit is pending in the courts between the Richmond and Eureka Consolidated Companies; the horse disease has made it next to impossible to freight ore or bullion; and deep snow has put the roads in a bad condition. New bodies of ore may of course be speedily formed, but till then our main dependence must be on the K. K., Richmond, and one or two other mines which happen to have good sized bodies of ore in sight.

FURNACES.

The Silver West furnace, built by Mr. Thomas J. Taylor, is the only one now running. It is supplied with K. K. ore, the price charged for smelting being $22 per ton. The furnace of the Ruby Consolidated had a long and successful run, but it is now idle—from a cause I cannot explain. A restraining order of the court closed the Richmond furnace, and it may be months before it starts up again. All the Eureka Company's furnaces are old.

FUTURE MINING PROSPECTS.

The Excelsior mine, on Prospect mountain, proves to be a very valuable property, there being large quantities of fifty dollar ore available. Since last summer the Hoosac mine, on the Secret Cañon road, has become quite celebrated. It appears to be a contact vein and yields large amounts of metallic ore, rich in lead as well as silver. The Pioneer mine, recently incorporated in San Francisco, promises well, as does also the Orange, higher up on the eastern slope of Prospect mountain. A small vein known as the Paul Jones, situated on Coy Hill, at the upper end of the town, has been yielding some rich chloride ores, assaying up into the thousands.

A HEAVY LAWSUIT.

The case between the Eureka Consolidated and Richmond Companies has some curious features about it. The former company owned a square location, called the Lookout, and secured a patent without finding a lode. The Richmond was located west of it at a later date, and was both a square and a lode location. As the Richmond developments progressed, the works came to be under the Lookout ground, and were cut into by a perpendicular shaft sunk 250 feet through limestone by the Eureka Consolidated Company. A suit was commenced, and until that is ended it is useless to surmise who will be the owners of the immense ore deposit which has been intersected. The Richmond Company—a London organization—claims a north and south lode, with the right to follow it on the dip into the adjoining ground, but the Eureka Consolidated Company alleges that the Richmond is almost an east and west ledge which is being followed along its course beyond established surface lines. One of the pleas of the latter is that aliens cannot obtain a patent to mining ground by conveying it to an American citizen for the purpose of making application in his name on their behalf. Mr. Clarence King is said to be the principal manager of the Richmond Company, and holds its property in trust.

WEATHER.

This has been a very severe winter, the snow being about a foot deep in the valleys and any depth one can reasonably desire on the mountain slopes. Hitherto beef cattle have kept in good condition running out, but the next thirty days will be hard on them if the snow continues on the ground.

Utah.

The Salt Lake *Tribune* of March 15 has the following summary for the month o February.

THE WEATHER.

The continuous snow storms during the present month have checked prospecting, materially interfered with the opening of new mines, and also communication with the mining camps, on account of the roads being blockaded, thereby causing much difficulty in the transportation of ores and supplies. The raw-hide-train movement inaugurated in Little Cottonwood by Mr. CARLYLE, has been of incalculable benefit, as it seems to work equally well, let the weather be never so stormy. Large quantities of ore have been freighted from the mines to the furnaces by this method of transportation and constant communication with the camps secured.

LITTLE COTTONWOOD DISTRICT.

Snow has varied during the month from eight to fourteen feet on the level; nevertheless work has been vigorously prosecuted on the Hiawatha, Last Chance, Montezuma and Savage Mines, belonging to the Utah Windsor Mining Company. Developments are going on in these mines with bright prospects for the future. A four-foot vein of rich ore has been struck in the Savage. Veins of the Montezuma, Hiawatha and Last Chance are not so large, but produce high grade ore. It is proposed to have all the ores from these mines smelted at the Saturn works, Sandy Station. Work is also going on in the Highland Chief and Stoker, on Emma hill, also in the Laramie, Darlington, City of Rocks, Topeka, Imperial, and others, on Davenport hill. Operations on the Emma mine have not slackened. A full crew of hands are kept constantly employed, and the ore turned out is in quality quite up to the average. A shaft has just been completed eighty feet below the lowest level, and drifting from this shaft will be immediately commenced. Upwards of eight hundred tons of ore are sacked up and stored in the ore houses ready for shipment.

THE FLAGSTAFF, VALLEJO AND GRIZZLY MINES continue to be actively worked and keep adding to their piles of ore. Work on the Davenport and Matilda mines was partially suspended during the latter part of last month and beginning of the pre-

sent, on account of the difficulty in transporting the ores, but work has been resumed with a full force of men.

THE NORTH STAR MINE.—A large quantity of ore is on the dumps and plenty sacked up and ready for shipment. The prospects of the Frederick mine are very favorable for the coming season: work is being daily performed on it, and the indications are very satisfactory.

THE WELLINGTON MINE.—It is currently reported that another large body of high grade ore has been struck, but of the estimated quantity in sight we have no information.

THE UTAH TUNNEL COMPANY are reported to have reached ore of a superior quality and are very hopeful of increased success.

THE PHŒNIX AND EQUITABLE TUNNELS are being vigorously worked, and indications are promising.

THE RELIANCE TUNNEL was located in 1871 and incorporated in Salt Lake City, July 30th, 1872. President, PHILIP PUGSLEY; Secretary, R. J. GOLDING. Capital stock, $800,000, divided into 80,000 shares of $10 each. This tunnel is now in 180 feet and has passed through a fine vein of ore. A contract has been let, to run 500 feet by means of a steam drill. The tunnel is about 600 feet below and south of the Illinois Tunnel, and is calculated to pass through the Emma and other celebrated mines at a great depth.

THE GLADIATOR TUNNEL AND MINING COMPANY was located in July, 1869, and incorporated February 14th, 1872. A. S. GOULD, President; CHARLES A. GOULD, Secretary. Work on this tunnel has been done to the extent of 440 feet, crossing several first-class veins, but no drifting has yet been done, it being the intention to continue the work until the whole length of the location, 3,000 feet, is reached. The prospects are said to be very flattering as to striking rich veins and deposits. Work has been going on all winter, and will be steadily continued towards completion.

THE NARROW-GAUGE RAILROAD, now being built by the Wasatch and Jordan Valley Company, commenced track-laying before the late storm set in, and although laboring under great difficulties, through bad weather, have already about three miles of iron down. The locomotive is *en route* and may be expected any day.

PARLEY'S PARK DISTRICT.

In this district the Park Silver Mining Company, incorporated in Michigan, December, 1872, are sinking a shaft 150 feet on the Flagstaff mine, and are now down about forty feet. Over five tons of ore are being taken out of the mines per diem.

THE PENINSULAR TUNNEL AND MINING COMPANY, organized in Salt Lake City November 8th, 1872. Capital stock $2,000,000. Officers—GEORGE C. BATES, President, F. A. NIMMS, Secretary and Treasurer, W. H. HOWLAND, Superintendent. This company proposes to tap seven different veins. Their operations are carried on in Snake Creek. A tunnel has been commenced and is already in seventy-five feet. The first of the seven veins has been reached, and is pronounced to be a very fine body of ore.

THE HOWLAND TUNNEL is being driven ahead; it is already in between 225 and 260 feet, and the indications are that a body of ore will very shortly be reached.

THE WASATCH, ST. JOSEPH, ETNA AND ESTHER MINES show excellent prospects. Work on them has been temporarily suspended, but will shortly be resumed.

THE FLAGSTAFF MINING COMPANY was organized in Michigan, in December 1872, with a capital stock of $500,000. The officers are—L. G. MASON, Vice President, A. H. MORRISON, Treasurer, F. A. NIMMS, Secretary.

THE PIONEER MINE.—Work will be resumed on this mine, weather permitting, in or about the middle of April, with a force of twenty-five men. It is the intention to sink a shaft on the vein at the south side of the hill to a depth of 200 feet, and to run a drift from the north to the south side of the hill, so as to tap the bottom of the shaft. A road will also be constructed to join the Pinyon road, with a view of facilitating the transportation of ore taken out from the workings. A large body of ore is exposed by a break from the top of the hill. The body is about four and a half feet in width, and assays 70 oz. in silver and 39 per cent. in lead to the ton. A shute will be constructed from the old dump, running to the roadway at the bottom of the hill. An ore house will also be constructed, and a large boarding house for the men employed in the works. This property gives every promise of being as fine as any in the Territory, and is said to be second to none in the district. Ten tons of ore from this mine was sold in this city in the fall of 1872, and yielded a net profit of $90 per ton after paying all expenses. A rumor is current that the property has recently changed hands, but we are not advised as to the names of the buyers.

BINGHAM CANYON.

Some changes have taken place in the management of the

WINNAMUCK MINES AND SMELTING WORKS recently sold to a German Company. Gov. G. L. WOODS, and RICHARD C. HAWKINS, Esq., having been elected to the offices of resident directors.

THE LAST CHANCE MINE is being thoroughly worked. A shaft has been sunk 300 feet below the discovery shaft, and intersected at that point by a tunnel 350 feet in length. The shaft sunk below the tunnel 125 feet has two sets of leads driven above tunnel level, a tunnel level driven east and west on the course of the vein, and two set of leads, started below the tunnel. The lode throughout averages twenty-five inches, and the ore assays from $50 to $230 per ton in silver and gold. About 500 tons of ore are on the dump averaging $85 per ton. 270 tons were lately sold at $50 per ton net on the dump, the buyers to take it away. The quantity of ore developed by the various workings now fully justifies the erection of furnaces, which will be shortly commenced so as to be ready when the narrow-gauge connection with Bingham City and Sandy is effected.

THE SPANISH MINE has recently been sold for a large sum of money to a wealthy New York company, and we believe it is their intention at an early day to erect smelters for the reduction of the ore of which there seems to be an almost inexhaustible supply.

THE UTAH SILVER MINING COMPANY. An increase of capital to the extent of £28,000 is being raised in London to carry on the work. A new superintendent has been appointed in place of Mr. MURPHY, the late incumbent. We learn also that Mr. ISAAC BATEMAN has been elected to the office of Resident Director. Work will be commenced as soon as the requisite funds come to hand from England. The bulk of ore will be dressed at the mines and either sold in the Territory or shipped to England. The dressing of the ore will be done by a machine at the Company's works, supplemented by Cornish rollers to be sent from England.

OPHIR DISTRICT.

DRY CANYON.—Owing to the unusual depth of snow, which averages between three and four feet, mining and general business is very dull.

THE MONO MINE has, been actively worked by a force of from twenty to twenty-five men, and the ore turned out is said to be richer than ever.

THE MOUNTAIN CHIEF is looking remarkably well. A large body of high grade ore was struck in the shaft about the middle of the month.

THE EMPORIA, EVENING STAR, SHOO-FLY, MAGNOLIA, CHICAGO, HIDDEN TREASURE and OSCEOLA, are all worked more or less and present fine appearances. Every day some rich strikes are announced. The latter has a shaft down 200 feet.

THE UTAH QUEEN, CONVERSE, and MIAMI, recently sold to Eastern capitalists, are being worked successfully to the satisfaction of the present owners. The company will shortly commence the construction of a boarding house, ore houses, sheds, etc,

THE RISING SUN CONSOLIDATED, consisting of the Mid-day, Rising Sun and Monitor mines, is a fine property, and as far as developed shows as well as any mine in the camp. Work has been temporarily suspended, but will be resumed in a few days.

THE BELLA WILFER.—Recently rich strikes are reported to have been made in this mine, and the owners feel much encouraged.

THE NEW JERSEY MILLING COMPANY.—Messrs. HENDRICKSON and KRAUSS of this company have arrived at the scene of their future labors, and are busily engaged in making preparations for active operations in the spring.

LION HILL, EAST CANYON.—The prevalence of severe storms prevented transportation of supplies, and to a great extent communication with the mining camps for nearly a month, and as a consequence work of all kinds was suspended; but the roads have been since opened and there is now some activity. Charley Price, has in his possession a five ounce specimen of horn silver, taken from a mine in this district, of which he is a fourth owner. The assay value of the specimen is $27,000 to the ton. The shaft in the mine is down about fifty feet, and a rich four foot lead is opened. We understand that $300,000 has been offered and refused for the mine.

The owners of mines and merchants in both of the above named camps look for lively times after the fine weather sets in.

AMERICAN FORK CANYON.

Work of all kinds at this canyon has been at a standstill all the month. The Miller mine, Sultana smelters, American Fork Railroad and the Wood and Fuel Company have all suspended operations for the present. Major WILKES, general manager, and Mr. LOWELL, resident Secretary, besides other officials connected with the Miller mine, the Sultana works and American Fork Railroad, have resigned their positions; the places of the two former having been supplied by S. DEWOLF, Esq, as Manager, and Mr. MCNAMEE as Secretary.

TINTIC DISTRICT.

EUREKA CITY.—Times are very dull in that city owing to the deep snow and severity of the weather. We are informed that the Eureka Company will resume work on a large scale as soon as practicable.

GREELEY SPRINGS.—In this district HARMON, HENDERSON & Co. and another company are running tunnels with excellent prospects, working twenty-four men. The Comstock lode is much talked about.

HOMANSVILLE.—The Wyoming custom mill is doing well. The Eureka mill has temporarily suspended operations for repairs.

COPPEROPOLIS.—The Mammoth Copperopolis and Crismon's Mammoth, the Swansea, Sunbeam, Milton, Black Dragon, Golden Treasure, Ruby, Chicago, Saratoga, and some of the Pioche company's mines rank favorably with any mine in the Territory. The two former have increased the number of their employees.

SILVER CITY is considered to be as good a mining camp as any in the city. Notwithstanding the deep snow some prospecting is going on with favorable results.

Tintic from all accounts appears to be a very desirable mining district, and one that should not be passed over by capitalists desiring to make investments in mining property. Added to the fact of the large number of true fissure veins which have been discovered, is the circumstance of the claims being in the hands of men with small means who for a moderate consideration would be willing to enter into equitable arragements with any one furnishing the necessary means to develop their property—are the facilities for working the mines, which are equal to any other district in the Territory, timber being both close and in great abundance, while the mines can be worked both winter and summer, being approachable by wagons at all seasons of the year—and, lastly, Tintic is surrounded by the most productive agricultural valleys in the Territory, which in a very short time will be within easy reach of two railroad lines, the Utah Southern on the east, running up Utah valley, and the Salt Lake and Pioche Railway, running down Tintic valley, either through, or in close proximity to, the mining camp.

CAMP FLOYD DISTRICT.

THE QUEEN OF THE WEST Mine is owned by a company in Detroit, Michigan, and was organized in November, 1872, since which time work has been pushed forward, and they are taking out very rich ore, which is being milled by Messrs. HUSSEY & BAXTER at their mill in Fairfield, not far from the mine. The results are highly satisfactory, the ore yielding $200 to the ton. The bullion is 995 fine, which is an extraordinary degree of fineness. There is now about 1,000 tons of ore on the dump, with thousands more in sight. The company purposes building a mill of their own as early in the spring as possible.

THE FAIRFIELD MILL.—This mill, owned by HUSSEY, BAXTER & Co., is located at Fairfield, Camp Floyd. It was started about the 20th of last month, and is in successful operation on ores from the Queen of the West mine at Lewiston. The system adopted is dry crushing by the Dodge crusher, and pulverizing by the attrition mill. From thence the pulp is taken to the Dodge pans, then amalgamated and flowed into the Dodge settlers, which collects all the quicksilver that may possibly pass off in the pulp from the pans. The process is said to work perfectly, the results averaging about 90 per cent of assay value. About ten tons of ore can readily be worked a day, and the engine power is abundant for double the amount of work.

Advertisements.

The special advantages of the ENGINEERING AND MINING JOURNAL, *as a medium for advertisers, are so great and so widely known that it may seem almost needless to call attention to them. It is extensively circulated among the engineers of the country and takes a position in this respect before any other publication of the kind. It has a large and constantly increasing circulation among miners and mine owners, and men connected with mining operations generally. As it is the only paper in the country that makes this subject a specialty it has this field entirely to itself, and is the only direct and reliable means of reaching this class of persons. Being kept on file by almost every subscriber, it is doubly valuable as a permanent means of keeping an advertisement before the public. It is the Organ of the* AMERICAN INSTITUTE OF MINING ENGINEERS, *and is regularly received and read* BY ALL THE MEMBERS AND ASSOCIATES *of that large and powerful society,* THE ONLY ONE OF THE KIND IN THIS COUNTRY. *It is therefore the best medium for advertising all kinds of machinery, tools and materials used by engineers or their employees. It is the recognized organ of the coal trade, and is taken extensively by the trade throughout the country, and presents the very best means of reaching that very important class of men.*

Rates of Advertising.

The rates of advertising, compared with those of other weekly industrial publications, are very low, especially when the class of consumers among which its large circulation is almost entirely confined, is taken into consideration.

Back Page ..... 40 cents a line.
Inside Pages ..... 25 cents a line.

Engravings may head advertisements at the same rate per line, by measurement as the letter-press.

MISCELLANEOUS.

WM. A. SWEET, Pres't. GEO. W. HARWOOD, Treas. FRED. B. CHAPMAN, Sec'y.

SWEET'S MANUFACTURING CO.,
SYRACUSE, N. Y.,

MANIPULATORS OF

Bessemer Steel,
Siemens Martin Steel,
Cast Steel,
Blister Steel.

MANUFACTURERS OF

Sweet's Cast Steel Crow Bars,
Sweet's Cast Steel R. R. Bars,
Sweet's Oil-tempered Seat Springs,
Sweet's Excelsior Steel Tire,
Swede's Spring Steel,
Cast Spring Steel,
English Spring Steel,
Sleigh Shoe Steel,
Cutter Shoe Steel,
Frog Point Steel.

Nov. 19:1y

SUPERIOR RAIL MILL.—CAPACITY: 1,000 TONS PER WEEK.

Harbaugh, Mathias and Owens,

Manufacturers of

RAILROAD IRON,

Office, corner Fifth Avenue and Smithfield Street, Pittsburgh.

Our central location enables us to draw from both sides of the Allegheny Mountains Metals and Ores best adapted for making a No. 1 Rail, and together with our Improved Machinery, are a sufficient guarantee of our ability to produce Rails of a quality unsurpassed for durability and strength, by any foreign or domestic manufacture.

New Patterns, of any desirable weight, made to order on Short Notice.

We respectfully solicit orders for New Rails, or Re-rolling. June 25.1y

---

UNITED ROYAL SMELTING WORKS

OF THE

KINGDOMS OF PRUSSIA AND SAXONY.

GENERAL AGENCY—R. J. ROBERTSON, HAMBURG, GERMANY,

Whose representative for the United States,

H. ROBERTSON, 149 BROADWAY, NEW YORK,

Is ready to receive consignments of

ORE and all kinds of FURNACE STUFF

For the above-named Works.

Full particulars given on application. Oct. 8-tf

MISCELLANEOUS.

LEHIGH ZINC COMPANY.

GORDON MONGES, Treasurer. B. C. WEBSTER, President.

WORKS, BETHLEHEM, PA. OFFICE, 333 Walnut Street, Philadelphia.

JOHN JEWETT & SONS, AGENTS, 182 FRONT STREET, NEW YORK.

OXIDE OF ZINC, SPELTER, SHEET ZINC.

Jun28:1y SPIEGELEISEN CINDER FOR BLAST FURNACES.

IMPROVED DIRECT-ACTING MINING LOCOMOTIVE

Gauge, two feet six inches or upwards; Hight above rail, five feet four inches; Width over all, five feet one inch. Adapted to burn Anthracite or Bituminous coal or coke.

Materials and Workmanship Equal to those in Full Gauge Railroad Locomotives,

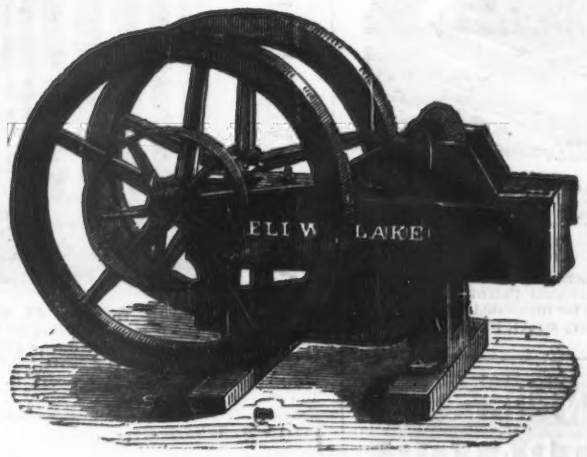
Guaranteed to pass curves of twenty-five feet radius and haul on a level track in good condition.

Three Hundred and Forty Gross Tons of Cars and Load

For Photograph and full particulars, address M. BAIRD & CO., Baldwin Locomotive Works, Philadelphia.

Feb:7-1y:eow

BLAKE'S STONE AND ORE BREAKER.



The office of this Machine is to break Ores and Minerals of every kind into small fragments, preparatory to their further comminution by other machinery. Also to break stone for McAdam roads, and Ballasting Railroads.

This machine has now been in use, enduring the severest tests, for the last ten years, during which time it has been introduced into almost every country on the globe, and is everywhere received with great and increasing favor as a labor-saving machine of the first order.

Illustrated circulars, fully describing the machine, with ample testimonials to its efficiency and utility, will be furnished on application, by letter to the undersigned.

☞ The Patents obtained for this machine in the United States and in England having been fully sustained by the courts, after well contested suits in both countries, all persons are hereby cautioned not to violate them; and they are informed that every machine now in use or offered for sale, not made by us, in which the ores are crushed between upright convergent faces or jaws actuated by a revolving shaft and fly-wheel, are made and used in violation of our patent.

☞ Those who visit New York City can be shown this machine in operation by inquiring of B. R. WESTERN 37 Park Row who will give information, prices, &c., and receive orders.

Mch. 14-1y. Address BLAKE CRUSHER COMPANY, New Haven, Conn.

A. VIVARTTAS,

Architect and Engineer,

31 BROADWAY,

NEW YORK.

THE TANITE COMPANY,

Manufacturers of **Solid Emery Wheels**, from one inch to three feet diameter. **Emery Grinders** for Stove Manufacturers, Foundries, Machine and Railroad Shops, Planing Mills and Saw Mills. Emery Wheels and Saw Gumming Machines for sharpening and gumming **Gang, Mulay and Circular Saws.**

A judicious use of Tanite Emery Wheels and Grinding or Gumming Machines, will more than repay the cost in this year's work! Write for Circulars and Photographs to

THE TANITE CO., Stroudsburg, Monroe Co., Pa.

Feb. 25:6m

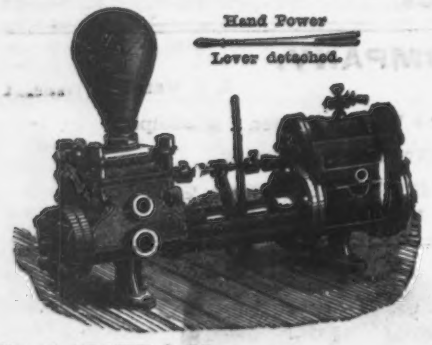
SCHOOL OF MINES, COLUMBIA COLLEGE.

FACULTY.—F. A. P. BARNARD, S.T.D., LL.D., PRESIDENT; T. EGLESTON, Jr., E. M., Mineralogy and Metallurgy; F. L. VINTON, E. M., Civil and Mining Engineer; C. F. CHANDLER, PH. D., Analytical and Applied Chemistry; JOHN TORREY, M.D., LL.D., Botany; C. A. JOY, PH. D., General Chemistry; W. G. PECK, LL.D., Mechanics; J. H. VAN AMRINGE, A.M., Mathematics; O. N. ROOD, A.M., Physics; J. S. NEWBERRY, M.D. LL.D., Geology and Paleontology. Regular courses in Civil and Mining Engineering; Metallurgy; Geology and Natural History; Analytical and Applied Chemistry. Special students received for any of the branches taught. Particular attention paid to Assaying. For further information and catalogues, apply to

DR. C. F. CHANDLER, Dean of the Faculty.

Nov. 21:1y

MACHINISTS' SUPPLIES.

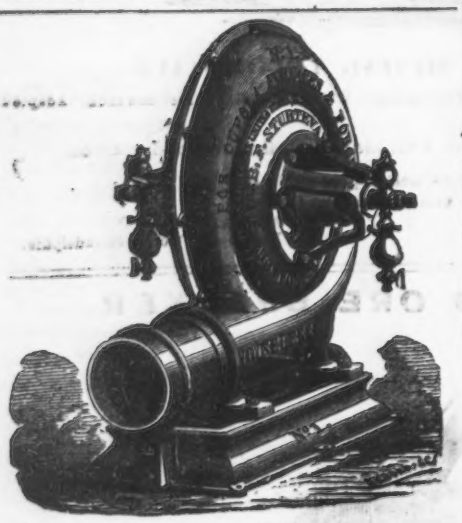


GEO. F. BLAKE & CO.,
MANUFACTURERS OF BLAKE'S PATENT
STEAM PUMPS.
No. 79 LIBERTY STREET, NEW YORK.
Factory 51 Chardon St., Boston, Mass.

A specialty made of the manufacture of DOUBLE-ACTING PLUNGER PUMPS for mining purposes—combining economy of space, capacity, and great durability. All wearing parts made of composition metal.

Also, Boiler Feed Pumps, Fire Pumps, Tank Pumps, Wrecking Pumps, etc., etc.

Send for Illustrated Price Circular. m-26-3m



B F. STURTEVANT'S
PATENT IMPROVED
PRESSURE BLOWER,
FOR CUPOLA FURNACES AND FORGES.

Also manufacturer of the Sturtevant Patent Improved Fan Blower and Exhaust Fan. Send for illustrated catalogue.

B. F. STURTEVANT, 72 Sudbury street, Boston, Mass.
n29:1y

KROM'S PATENT DRY ORE
CONCENTRATOR
AND COMPLETE MACHINERY
FOR CRUSHING SCREENING
AND CONCENTRATING ORES.

Minerals and Ores in which the difference of specific gravity is so slight and which are also sometimes in such fine particles as to defy separation by any other machinery or method, are rapidly separated by this Concentrator.

Mr. W. Bement, of Georgetown, Col., concentrating Silver ores, says: "I am satisfied your machines can not be beaten; they are simple, require no power(comparatively,) and do not get out of order."

A comparison is challenged between the results obtained by the approved methods of water concentration and the complete system of dry-ore concentration in the amount of ore saved, quantity concentrated, economy of working, and comfort of the operators and workmen

Parties interested in mining are invited to call at No. 210 Eldridge street, New York, where they may see a machine in operation and have samples of their own ores crushed and concentrated.

For information and circulars, apply to
S. R. KROM,
No. 210 Eldridge street, New York City.

WILLIAM F. McNAMARA,
SOLICITOR OF PATENTS
AND COUNSELLOR-AT-LAW,
No. 37 PARK ROW, NEW YORK, ROOM 22.
Advice in Patent Law given free. mar 8:tf

MISCELLANEOUS.

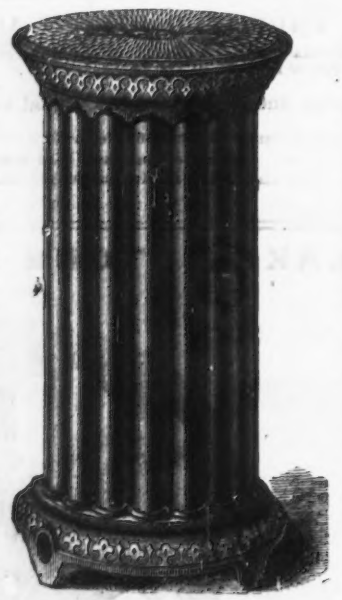
The Bessemer Steel Works,
of John A. Griswold & Co.
Troy, N. Y., May 3, 1872.

B. F. Sturtevant, Boston, Mass.,

Dear Sir: We have changed your No. 8 for your No. 9. Pressure Blower. The time in melting is about the same with either Blower. We are melting 225,000 lbs. (112½ tons,) Pig Iron daily. (20 hours running time.) It works well.

BARNEY MEE, Supt.

ENGINES, IRON WORK, ETC.



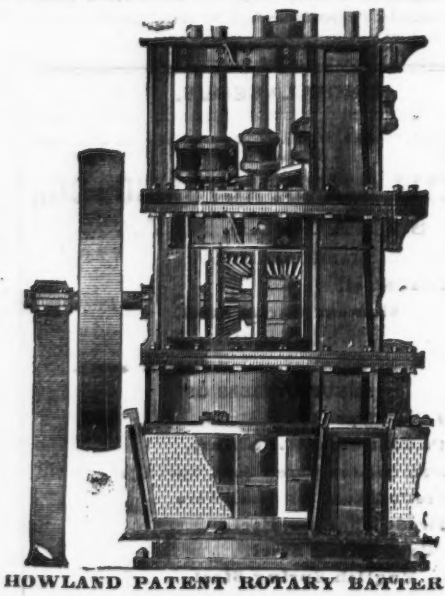
JOSEPH NASON'S VERTICAL TUBE RADIATORS IN VARIOUS SIZES AND PATTERNS.

JOSEPH NASON & CO., 61 BEEKMAN ST., corner of Gold street.—WROUGHT and CAST-IRON PIPES; all kinds of STEAM and GAS FITTINGS; Apparatus for WARMING and VENTILATING BUILDINGS.
JOSEPH NASON. HENRY B. WORTHINGTON.
nov29-1y

JOHN J. ENDRES,
Mining and Civil Engineer,
MANUFACTURER OF MACHINERY FOR MINING AND SMELTING PURPOSES.
SPECIALITY:
Patent Ore and Coal Crushing and Washing Machines.
BUILDER OF IMPROVED COKE OVENS AND MACHINERY FOR DISCHARGING THE SAME.
Office and Works:
SOUTH PITTSBURGH PA.
Nov. 26:3m

W. B. COGSWELL,
Civil & Mechanical Engineer.
SPECIALITY:
Blast Furnace Construction.
P. O. Address
Franklin Iron Works,
Oneida County,
Nov. 19:1y, N. Y.

MINING MACHINERY, ETC.



HOWLAND PATENT ROTARY BATTERY

of 12 stamps. It requires no frame to put it up. The best Battery ever used for amalgamating gold, or crushing silver ores, dry or wet. Can be put up on a mine in running order for one-half the price of the straight battery, and in three days after its arrival at the mine. 12-stamp battery, 20,000 pounds, with frame complete; 6-stamp battery, 7,000 pounds. Every mill run at shop before shipping.

CALIFORNIA STAMP MILLS,

All the various styles of Pans, Amalgamators, Rock Breakers, Separators, Settlers, Concentrators, Dry or Wet, for working Gold, Silver or Copper Ores, the same as built in California and at lower prices. SHOES AND DIES made of the best white iron. Send sizes and we will make patterns and forward Shoes and Dies at low prices. Engines, Boilers and fixtures, and other Machinery made to order.

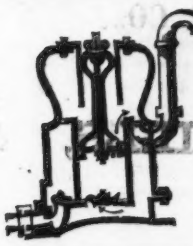
☞ Send for a Circular.
Address MOREY & SPERRY,
Jan 6:6m 95 Liberty Street New-York.

COOPER'S GLUE AND REFINED GELATINE

COOPER HEWITT, & CO.,
NO. 17 BURLING SLIP, NEW YORK.
Bar Iron, Braziers' Rods, Wire Rods, Rivet and Machinery Iron, Iron and Steel Wire of all Kinds, Copperas &c., &c.
RAILROAD IRON, COOPER WROUGHT IRON BEAMS AND GIRDERS,
Martin Cast-Steel, Gun-Barrel and Component Iron,
PUDDLED AND REFINED CHARCOAL BLOOMS,
Ringwood Anthracite and Charcoal Pig Iron.
Works at Trenton and Ringwood, N. J.
May 17:1y

DENISON'S COOLING AND LUBRICATing Compound will immediately cool a hot journal when in motion. Send for a Circular.
POSTS & KALKMAN, Manufacturers,
Sept. 17:6m 111 Liberty Street, New York.

MISCELLANEOUS.



MINING PUMPS.

Well Pumps,

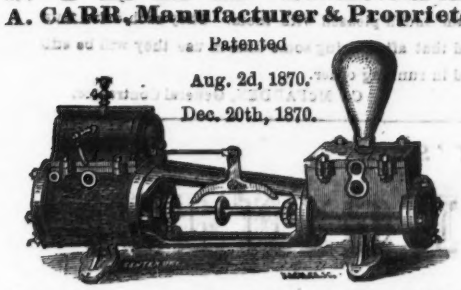
AND PUMPS FOR ALL PURPOSES.

Simple, cheap, and effective.

J. D. WEST & CO.,
40 Cortlandt St., N. Y.

THE SELDEN DIRECT-ACTING
STEAM PUMP
A. CARR, Manufacturer & Proprietor.

Patented
Aug. 2d, 1870.
Dec. 20th, 1870.



Combining simplicity and durability to a remarkable degree. Its parts are easy of access, and it is adapted to ALL PURPOSES for which Steam Pumps are used.

AS A MINING PUMP

It is unsurpassed. Also,

Steam, Gas and Water Pipe, Brass Work. Steam and Water Gauges, Fittings, etc. etc.

Send for Price-List and Circulars.

Address A. CARR,
feb15.72:24 43 Courtlandt Street, New York.

CLAY CARBONATE COPPER ORE,

(SUITABLE FOR WET PROCESS.)

1,000 Tons 5 per Cent Yield.

FOR SALE AT VERY LOW FIGURES.

WHEATLEY & HARVEY,
Schuylkill Copper Works,
PHOENIXVILLE,
Jan. 14:6ms PENNSYLVANIA.

COPPER ORES WANTED.

WHEATLEY & HARVEY,
"SCHUYLKILL COPPER WORKS,"
PHOENIXVILLE,
Jan. 14:6m PENNSYLVANIA.

BABCOCK

FIRE APPARATUS.

Engines, Tanks,
EXTINGUISHERS,
HOOK AND LADDER TRUCKS,
F. W. FARWELL, Sec.,
407 Broadway, (near Canal St.,) New York.

C. **F. A. HINRICHS.**
ESTABLISHED 1801.

Sole Owner and Dealer in the celebrated all-metal Saint Germain or

GERMAN STUDENT'S LAMP.

Staehlen's Patent Lamps. These lamps give the steadiest and clearest light and are the safest in use, particularly suitable for

Engineers' Miners' and Draftmen's

Night Work. Also Importer of Fine Glassware, French Chins, Lava, Parian, Toys, Fancy Leather Goods, Clocks, Bronzes, Cutlery, Smokers' Articles, Masks, Looking Glasses, &c., &c.
Display and Retail Sales for the Holidays during December.

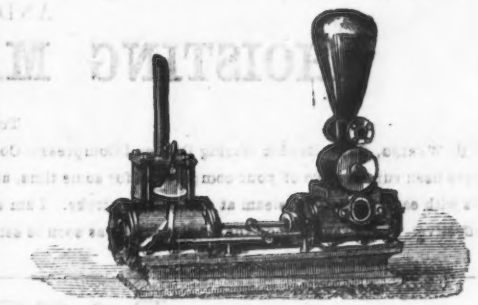
29, 31, 33 Park Place,
Oct. 29:3m NEW YORK.

STEAM PUMPS.

STEAM PUMPS,

Double Acting.
Bucket Plungers are the best. Send for Circular. Valley Machine Co. Easthampton, Mass

Niagara Steam Pump Works.



This Pump has taken the first premium at every Fair in the United States where there has been a practical test.

CHARLES B. HARDICK,

No. 23 ADAMS STREET, BROOKLYN, N. Y.,

Sole Manufacturer of

HARDICK'S PATENT DOUBLE-ACTING

STEAM PUMPS AND FIRE ENGINES,

Patented in England, Belgium and France. Send for circular. feb-13-1y

---

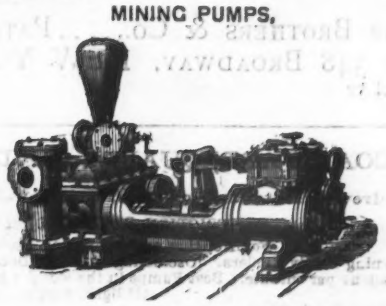
HYDRAULIC WORKS.

MANUFACTORY,

BROOKLYN, N. Y.

Steam Pumping Engines, Single and Duplex, Worthington's Patent, for all purposes, such as Water Works Engines, Condensing or Non-condensing; Air and Circulating Pumps, for Marine Engines; Blowing Engines; Vacuum Pumps, Stationary and Portable Steam Fire Engines; Boiler Feed Pumps, Wrecking Pumps,

MINING PUMPS,



Water Meters, Oil Meters; Water Pressure Engines.
Steam and Gas Pipe, Valves, Fittings, etc. Iron and Brass Castings.
☞ Send for Circular.

jan2-1y H. R. WORTHINGTON,
59 Beekman street, New York.

J. **CLAYTON'S**

Patent Fly Wheel

STEAM PUMP,

AND

STEAM ENGINE

COMBINED.

These pumps are the cheapest first-class pumps in the market.

All sizes made to order at short notice.

JAMES CLAYTON, 24 & 26 Water st.,
Nov18-tf Brooklyn, N. Y
Office: 50 & 52 John street, New York.

STEAM ENGINES.

Portable and Stationary. "The Best, Cheapest, most Durable." Improved Circular Saw Mills, Screw and Lever Set. Send for Circular.

UTICA STEAM ENGINE CO., UTICA, N. Y.

G. G. YOUNG, General Agent,
Nov. 12:6mos 42 Cortlandt Street, New York.

COAL SHIPPERS.

THE NEWBURGH ORREL COAL COMPANY

Mines at Newburgh, Preston Co., W. Va.
Company's Office, No. 52 S. Gay St. Baltimore, Md.
C. OLIVER O'DONNELL.....President.
CHAS. MACKALL.....Secretary

This Company offer their very superior Gas Coal at lowest market prices.

It yields 10,996 cubic feet of gas to the ton of 2,240 lbs. of good illuminating power, and of remarkable purity; one bushel of lime purifying 6,792 cubic feet, with a large amount of coke of good quality.

It has been for many years very extensively used by various Gas Companies in the United States, and we beg to refer to the Manhattan, Metropolitan, and New York Gas Light Companies of New York, the Brooklyn and Citizens' Gas Light Companies of Brooklyn, N. Y., the Baltimore Gas Light Company of Baltimore, Md., and Providence Gas Light Company, Providence, R. I.

The best dry coals shipped, and the promptest attention given to orders. sep21-1y

---

Philadelphia and Reading
COAL & IRON CO.
OFFICE, No. 9 PINE STREET.

E. A. QUINTARD, Agent.

NEW YORK, March, 1873.

OFFER

Hard and Free Burning White Ash Coals,
Schuylkill Red Ash,
Alaska Red Ash,
Shamokin White Ash,
Shamokin Red Ash,
North Franklin,
Lorberry, and
Lykens Valley Coal,

ON BOARD, AT PORT RICHMOND

PHILADELPHIA,

OR

DELIVERED IN NEW YORK,

AND AT

ALL PORTS ALONG THE SOUND AND HUDSON RIVER.

Circulars of Prices will be issued on the 20th of each month.

COXE BRO.'S & CO., CROSS CREEK COLLIERY, MINers and Shippers of the Celebrated

Cross Creek Free Burning Lehigh Red Ash
COAL.
FROM THE BUCK MOUNTAIN VEIN.

OFFICES;
Philadelphia, No. 206 South Fourth street.
Drifton, Jeddo P. O., Luzerne Co., Pa.
Agent in New York, SAMUEL BONNELL, Jr.,
Room 43, Trinity Building,
feb-1 111 Broadway

DETMOLD & COX,

ANTHRACITE AND BITUMINOUS
COALS.

Office, 40 Trinity Building, New York. jan23-1y

STEPHEN S. LEE & SON,

Miners and Shippers of

GEORGE'S CREEK COAL
SWANTON MINES,
No. 49 West Lombard street,
may28-tf BALTIMORE.

MARYLAND COAL CO.,

Miners and Shippers of the best George's Creek Cumberland Coal.

Office No. 12 Trinity Building.
W. W. BRAMHALL, Secretary & Treasurer.
A. CHAMBERLIN, President.
jan23.1y JOHN K. SHAW, Vice President.

THE DESPARD COAL COMPANY OFFER THEIR Superior DESPARD COAL to Gas Light Companies throughout the country.

MINES IN HARRISON COUNTY, West Virginia.
Wharves, Locust Point, } Baltimore.
Company's Office, No. 29 South st. }
AGENTS:
PARMELEE BROTHERS, No. 32 Pine street, New York. BANGS & HORTON, No. 31 Doane street, Boston.

Among the consumers of Despard Coal we name Manhattan Gas Light Co., New York; Metropolitan Gas Light Co., New York; Jersey City Gas Light Co., Jersey City, N. J.; Washington Gas Light Co., Washington, D. C. Portland Gas Light Co. Portland, Maine.

☞ Reference to them is requested. may30-1y

"IRON" (WITH WHICH IS INCORPORATED the MECHANIC'S MAGAZINE,)

Journal of Science, Metals, Patents and Manufactures, Engineering, Building, Railways, Telegraphy, Shipbuilding, Factory News, etc., etc.

Subscription, 30 s. per annum, post paid.

To be had of all Newsvenders and from the offices, 99 Cannon street, London, England.

Advertisements.

Advertisements admitted on this page at the rate of 40 cents per line. Engravings may head advertisements at the same rate per line, by measurement, as the letter press.

Investment Bonds.

The NORTHERN PACIFIC RAILROAD 7-30 FIRST MORTGAGE GOLD BONDS, which we recommend as a profitable and well-secured investment, bear 7 3-10 per cent. gold interest, and have the following elements of security, viz. :

1. They are the obligation of a strong corporation.
2. They are a First Mortgage on the Road, its Equipments, Rights and Franchises.
3. They are a first lien on its Net Earnings.
4. There is pledged, in addition, for the payment of principal and interest, a Land Grant of 12,800 acres per mile through the States, and 25,600 acres per mile through the Territories traversed. The Company is already entitled to nearly Ten Million acres of its Grant, and its Land Sales thus far have realized $5 66 per acre.

With nearly 500 miles of the road completed and in operation, the earnings for 1873 will be large.

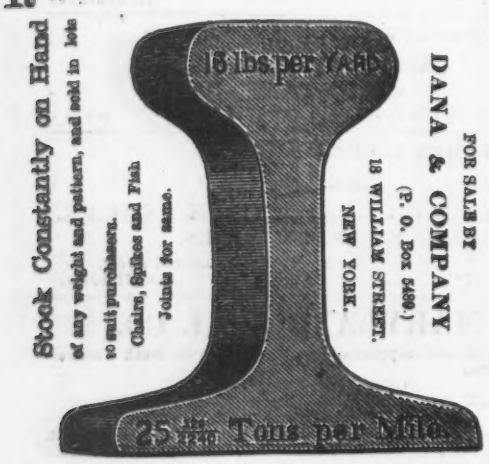
All marketable stocks and bonds are received in exchange for Northern Pacifics on most favorable terms.

JAY COOKE & CO.,

New York, Philadelphia & Washington.

FOR SALE BY BANKS AND BANKERS GENERALLY.

RAILROAD IRON FOR MINES.



Light Locomotives for use in Collieries, Mines, etc.
march 8 1y

THE

American Trade Journal.

Particularly devoted to the general trade interests of the country, has an established commercial circulation exceeding

40,000 COPIES,

extending throughout the United States, and to Great Britain, Brazil, Mexico, Central America, Buenos Ayres, Chili, Australia and Japan.

It has been the agent for the successful introduction to notice and sale of American productions in the countries named; and, by a steadily increasing circulation in that direction, has proven the most valuable medium for our trade interests abroad as well as at home.

Published Weekly and Monthly under the auspices of the

BOARD OF TRADE.

F. H. ROLLINS, 69 & 71 Broadway, New York.

Oct. 1. 1. year

RAND & WARING DRILL AND COMPRESSOR CO.,

21 PARK ROW, OPPOSITE NEW POST OFFICE, NEW YORK.

Manufacturers of

AIR COMPRESSORS, ROCK DRILLS,

AND

HOISTING MACHINERY.

EASTERN AND AMBOY RR.,
TUNNEL, NEAR BETHLEHEM, N. J., February 8, 1873.

MR. J. B. WARING, Supt. Rand & Waring Drill and Compressor Co., 21 Park Row, New York.

I have been running two of your compressors for some time, and I am much pleased with them. They each drive four 4" drills with ease, cutting off steam at one-quarter stroke. I am satisfied that after being some time in use they will be still more effective. I will report upon the third machine as soon as set up and in running order.

C. McFADDEN, General Contractor.

BACON'S

HOISTING ENGINES.

FOR MINES, BLAST FURNACES, PILE DRIVING, CONTRACTORS' USE, &C.
Adapted to Every Possible Duty.

COMPACT, STRONG, SIMPLE AND DURABLE.

Manufactured by

THE SPEEDWELL IRON WORKS,

OFFICE AND WAREROOM .....36 CORTLAND STREET, N. Y.
WORKS.....MORRISTOWN, N. J.

OTIS' SAFETY HOISTING MACHINERY,

Special adaptation for **MINES and FURNACES.**

Just Out—combining RAPIDITY of MOVEMENT, EASE of CONTROL and PERFECT SAFETY with GREATEST DURABILITY.

WORN PARTS CAN BE REPLACED IN A FEW MINUTES.

OTIS BROTHERS & Co.,....PATENTEES AND SOLE MANUFACTURERS.
OFFICE 348 BROADWAY, NEW YORK.....FACTORY AT YONKERS.
May 21:1 yr

COAL YARD, QUARRY, AND CONTRACTORS' APPARATUS.

Andrews's Patents, Noiseless, Friction-Grooved, Portable and Warehouse Hoisters.

FRICTION OR GEARED MINING AND QUARRY HOISTERS.

For Hoisting and Conveying Material to any Distance by Wire Cables.

Smoke-burning Safety Boilers. Oscillating Engines, Double and Single, ½ to 100 horse-power. Centrifugal Pumps, 100 to 100,000 gallons per minute. Best Pumps in the world; pass mud, sand, gravel, coal, grain, etc., without injury. All light, simple, durable and economical.

Send for circulars.

WILLIAM D. ANDREWS & BRO.,

oct-15-1y 414 WATER STREET, NEW YORK.

Diamond-Pointed STEAM DRILLS.

Recent improvements in connection with the celebrated LESCHOT'S patents, have increased the adaptability of these drills to every variety of ROCK DRILLING. Their use, both in this country and in Europe, has sufficiently established their reputation for efficiency and economy, over any other now before the public.

The Drills are built of various sizes and patterns, WITH and WITHOUT BOILERS, and bore at a uniform rate of THREE TO FIVE INCHES PER MINUTE in hard rock.

They are adapted to CHANNELLING, GADDING, SHAFTING, TUNNELLING and open cut work; also to DEEP BORING for TESTING the VALUE of MINES and QUARRIES. TEST ORES taken out, show the character of mines at any depth. Used either with steam or compressed air. Simple and durable in construction and never need sharpening.

Manufactured by

THE AMERICAN DIAMOND DRILL CO.,

No. 61 Liberty street,
feb4-6m New York.

Mass. Institute of Technology.

Entrance Examinations June 2 and 3, and Oct. 1 and 2. For Catalogue, recent entrance examination papers, or further information, apply to PROF. SAMUEL KNEELAND, Secretary, Boston, Mass. mar. 18; 4t.

LAFLIN & RAND

POWDER CO., 21 Park Row, opposite Astor House, New York,

invite attention to their facilities for delivering

BLASTING POWDER,

SAFETY FUSE,

ELECTRICAL BLASTING

APPARATUS, &c.,

wherever required, from having nine manufactories in different States, beside agencies and magazines at all distributing points. nov. 1-1y

---

B. B. FRENCH, C. E.,

BRIDGES,

IN IRON, WOOD, OR STONE.

DRAWINGS, ESTIMATES, &c.

155 Broadway, New York.

Dec. 31-3m

"ENGINEERING."

"The leading Engineering Journal of the world," indispensable to every Civil, Mining, or Mechanical Engineer, can NOW be obtained post-paid at $9 30 currency, by remitting Post Office order to NEW YORK OFFICE "ENGINEERING," 62 Broadway.